





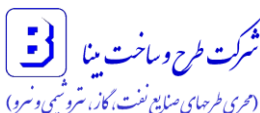



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	PROPANE DEHYDROGENATION (PDH) PROJECT						
MC :  APG	Piping Material Specification					 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Project Code	Sec.	Phase Code	Department	Doc. Type		Serial No.
Document Number:	3981-00-DE-PI-SPC-001					Rev.: 01	Page 1 of 216

Piping Material Specification



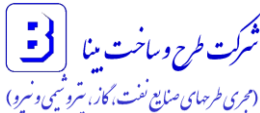

01	2-Feb-2026	Issued For Approval	M. Rajabi	M. Alipour	M. H. Eshraghi
00	20-Dec-2025	Issued For Comment	M. Rajabi	M. Alipour	M. H. Eshraghi
Rev.	Date	Purpose of Issue	Prepared	Checked	Approved
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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	2 of 216

TABULATION OF REVISED PAGES

Page	Revision									Page	Revision									Page	Revision								
	00	01	02	03	04	05	06	07	00		01	02	03	04	05	06	07	00	01		02	03	04	05	06	07			
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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	3 of 216

TABULATION OF REVISED PAGES

Page	Revision								Page	Revision								Page	Revision							
	00	01	02	03	04	05	06	07		00	01	02	03	04	05	06	07		00	01	02	03	04	05	06	07
109	✓								145	✓								181	✓							
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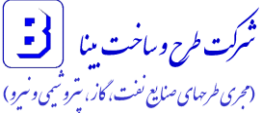

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : <div></div>	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
	3981-00-DE-PI-SPC-001						Rev.:	Page
Document Number:							01	4 of 216

TABLE OF CONTENTS

1. Introduction & Initial Information	5
1.1. Terms and Definitions	5
1.2. Scope of Document	6
2. Code and References	6
2.1 Code And Standards	6
2.2 References	9
3. Order of Precedence	10
4. Engineering Data	10
4.1 Identification System for Pipe Classes	10
4.2 Pipes	11
4.3 Flanges	11
4.4 Valves	12
4.5 Fittings	13
4.6 Gaskets	13
4.7 Bolting	13
4.8 NACE Requirements	13
5. Line Class Index	13
6. Abbreviation	18
7. Pipe Classes	20
8. Branch Tables	

OWNER:  Pars Petrochemical Co. (سهامی عام) Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part  شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.	Rev.:	Page
Document Number:	3981-00-DE-PI-SPC-001						01	5 of 216



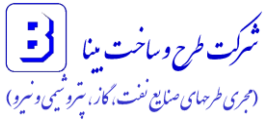

1. Introduction & Initial Information

Pars Petrochemical Company intends to build a propane Dehydrogenation (PDH) plant to produce 600 KTY propylene polymer grade based on UOP Oleflex technology in Pars south Special economic energy zone (PSEEZ), Asalouyeh, Bushehr Province, Iran. EPCC contractor for PDH plant: Panah Sanat Part Co., and BINA EPC Contractor Co. Consortium.

The plant consists of several main process units, including Feed Treatment, Dehydrogenation reactor CCR, Distillation, Hydrogenation reactor, refrigeration, Merox, utility, tankage, ...

1.1. Terms and Definitions

PROJECT:	Propane Dehydrogenation Plant (PDH)
Contract Number:	39-402/685: Between Owner and Contractor
OWNER:	Pars Petrochemical Company
MC:	Aria Pishro Gharn
CONTRACTOR:	Panah Sanat Part Co. and BINA EPC Contractor Co. Consortium
PDP	Based on UOP Oleflex Technology
BASIC DESIGNER:	Sinowey Company
Third Party Inspection	-
SITE:	Pars south Special economic energy zone (PSEEZ), Asalouyeh Bushehr Province, Iran.
SUBCONTRACTOR:	Organization/Party that CONTRACTOR hires to do a part of the WORK
GOODS:	Any and all equipment machinery, apparatus, material, and other PROJECT commodity described in the contractor's contract.
VENDOR:	Any manufacture/supplier selected by OWNER/CONTRACTOR to supply the GOODS
MFR.:	Any Company selected by OWNER/CONTRACTOR to fabricates GOODS according to the purchase order placed with the CONTRACTOR.

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MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.	Rev.:	Page
Document Number:	3981-00-DE-PI-SPC-001						01	6 of 216

Shall:

Indicates mandatory requirements to be strictly followed.

Should:

Indicates that through several possibilities, one is recommended as practically suitable, without mentioning or excluding others, or that a certain course of action is preferred but not necessarily required. Other possibilities may be applied subject to OWNER approval.

May:

It is used where a provision is completely discretionary

1.2. Scope of Document

This document covers the design and specifications for the required piping materials and includes the piping classes index and each piping class in detail

2. Code and References



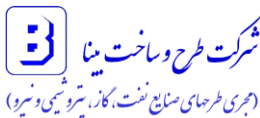

2.1 Code And Standards

All work shall be completed in accordance with engineering codes and standards listed below:



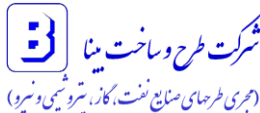

The following last (the most up to date) available codes and standards shall be used together with this standard specification for materials, design and dimensional requirements.

ASME B1.1	Unified Inch Screw Threads, (UN & UNR Thread Form)
ASME B1.20.1	Pipe Threads, General Purpose, Inch
ASME B16.5	Pipe Flanges and Flanged Fitting
ASME B16.9	Factory-Made Wrought BW Fittings
ASME B16.10	Face-to-Face and End-to-End Dimensions of Valves
ASME B16.11	Forged Fittings, Socket-Welding and Threaded
ASME B16.20	Metallic Gaskets for Pipe Flanges
ASME B16.21	Nonmetallic Flat Gaskets for Pipe Flanges
ASME B16.25	BW Ends
ASME B16.34	Valves-Flanged, Threaded, and Welding End

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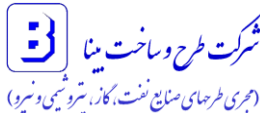

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	7 of 216

ASME B16.36	Orifice Flanges
ASME B16.47	Large Diameter Steel Flanges
ASME B16.48	Line Blanks
ASME B18.2.1	Square, Hex, Heavy Hex, and Askew Head Bolts and Hex, Heavy Hex, Hex Flange, Lobed Head, and Lag Screws (Inch Series)
ASME B18.2.2	Nuts for General Applications: Machine Screw Nuts, Hex, Square, Hex Flange, and Coupling Nuts (Inch Series)
ASME B31.3	Process Piping
ASME B36.10M	Welded and SMLS Wrought Steel Pipe
ASME B36.19M (Ed. 20220	Stainless Steel Pipe
ASME B46.1	Surface Texture (Surface Roughness, Waviness, and Lay)
ASTM A105	Carbon Steel Forgings for Piping Applications
ASTM A106	SMLS Carbon Steel Pipe for High-Temperature Service
ASTM A153	Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A182	Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service
ASTM A193	Alloy-Steel and Stainless Steel Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications
ASTM A194	Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
ASTM A216	Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
ASTM A217	Steel Castings, Martensitic Stainless and Alloy, for Pressure-Containing Parts, Suitable for High-Temperature Service
ASTM A234	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and High Temperature Service
ASTM A240	Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
ASTM A312	SMLS, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
ASTM A320	Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service
ASTM A333	SMLS and Welded Steel Pipe for Low-Temperature Service
ASTM A335	SMLS Ferritic Alloy-Steel Pipe for High-Temperature Service

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : <div> APG</div>	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	8 of 216

ASTM A350	Carbon and Low-Alloy Steel Forgings, Requiring Notch Toughness Testing for Piping Components
ASTM A351	Castings, Austenitic, for Pressure-Containing Parts
ASTM A352	Steel Castings, Ferritic and Martensitic, for Pressure Containing Parts, Suitable for Low-Temperature Service
ASTM A358	Electric-Fusion-Welded Austenitic Chromium-Nickel Stainless Steel Pipe for High-Temperature Service and General Applications
ASTM A387	Pressure Vessel Plates, Alloy Steel, Chromium -Molybdenum
ASTM A403	Wrought Austenitic Stainless Steel Piping Fittings
ASTM A420	Piping Fittings of Wrought Carbon Steel and Alloy Steel for Low-Temperature Service
ASTM A516	Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service
ASTM A671	Electric-Fusion-Welded Steel Pipe for Atmospheric and Lower Temperatures
ASTM B148	Aluminum-Bronze Sand Castings
ASTM B167	Standard Specification for Nickel-Chromium-Aluminum Alloys Seamless and Tube
ASTM B168	Standard Specification for Nickel-Chromium-Aluminum Alloys Plate, Sheet, and Strip
ASTM B165	Standard Specification for Nickel-Copper Alloy Seamless and Tube
API 594	Check Valve: Wafer, Wafer-Lug and Double Flanged Type
API 598	Valve Inspection and Testing
API 600	Bolted Bonnet Steel Gate Valves for Petroleum and Natural Industries Gas
API 602	Compact Steel Gate Valves Flanged, Threaded, Welding, and Extended-Body Ends
API 607	Fire test for Soft-Seated Quarter-Turn Valves
API 608	Metal Ball Valves-Flanged, Threaded and Welding Ends
API 609	Butterfly Valves, Double Flanged, Lug and Wafer-Type
API 6D	Pipeline Valves
BS 1868	Steel Check Valves (Flanged and Butt-welding Ends) for the Petroleum, Petrochemical and Allied Industries



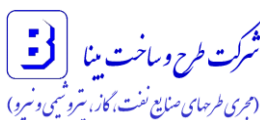

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MC : <div> APG</div>	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	9 of 216

BS 1873	Steel Globe and Globe Stop and Check Valves (Flanged and Butt-welding Ends) for the Petroleum, Petrochemical and Allied Industries
ISO 17292	Metal ball valves for petroleum, petrochemical and allied industries
MSS SP-6	Standard Finishes for Contact Faces of Pipe Flanges and Connecting-End Flanges of Valves and Fittings
MSS SP-75	Specification for High-Test, Wrought, Butt-Welding Fittings
MSS SP-95	Swage (d) Nipples and Bull Plugs
MSS SP-97	Integrally Reinforced Forged Branch Outlet Fittings - SW, Threaded, and BW Ends
NACE MR 0103/ISO17945	Petroleum, petrochemical and natural gas industries — Metallic materials resistant to sulfide stress cracking in corrosive petroleum refining environments
AWWA C207	Steel Pipe Flanges for Waterworks Service, 4" Through 144"
IPS-E-PI-221(2):2021/ INSO 22974:1400	Petroleum industry - Material specification for piping systems and pipelines - Technical requirements

2.2 References

3981-00-BA-PI-SPC-005	Specification for Piping External Coating
3981-00-BA-PI-SPC-015	Specification for Welding and NDT of Piping system
3981-00-BA-PI-SPC-021	Specification for Piping Material Valves
3981-00-BA-PI-SPC-022	Specification for Piping Material Steel Pipe Flanges and Orifice Flanges
3981-00-BA-PI-SPC-023	Specification for Piping Material Metallic Fittings
3981-00-BA-PI-SPC-024	Specification for Piping Material Pipe Purchase
3981-00-BA-PI-SPC-032	Specification for Gasket
3981-00-BA-PI-SPC-034	Specification for Bolt & Nuts
3981-00-BA-PI-SPC-033	Specification for Coating of UG Piping
3981-00-BA-PI-SPC-035	Specification for Cleaning and Protection of Piping
3981-10-BA-PR-MSD-002	Material Selection Diagram - Reactors And Heaters Section

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MC : <div> APG</div>	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
	3981-00-DE-PI-SPC-001						Rev.:	Page
Document Number:							01	10 of 216

3981-10-BA-PR-MSD-003	Material Selection Diagram - Reactor Effluent Compression Section
3981-10-BA-PR-MSD-004	Material Selection Diagram - Reactor Effluent Drier Section
3981-10-BA-PR-MSD-005	Material Selection Diagram - Separation System Section
3981-10-BA-PR-MSD-006	Material Selection Diagram - Hydrogen Purification System
3981-10-BA-PR-MSD-007	Material Selection Diagram - Solvent Recovery Section
3981-10-BA-PR-MSD-008	Material Selection Diagram - Steam Generation Section
3981-20-BA-PR-MSD-004	Material Selection Diagram - SHP Section
3981-20-BA-PR-MSD-005	Material Selection Diagram - Depropanizer Section
3981-20-BA-PR-MSD-006	Material Selection Diagram - Deethanizer Section
3981-20-BA-PR-MSD-007	Material Selection Diagram - Propylene-Propane Splitter Section
3981-20-BA-PR-MSD-008	Material Selection Diagram - Propylene Treater Section
3981-30-BA-PR-MSD-002	Material Selection Diagram - CCR Regeneration Section
3981-30-BA-PR-MSD-003	Material Selection Diagram - Inter-Reactor Catalyst Transport Auxiliary Equipment
3981-30-BA-PR-MSD-004	Material Selection Diagram - Intermediate Disengaging Hopper
3981-40-BA-PR-MSD-002	Material Selection Diagram - Regeneration Tower
3981-40-BA-PR-MSD-003	Material Selection Diagram - Regenerated Catalyst Transport
3981-00-BA-PI-CAL-010	Piping Wall Thickness Calculation
3981-00-BA-PI-DSH-056	Piping Special Component Data Sheet

3. Order of Precedence



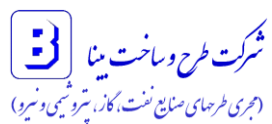

In case of conflict between requirements specified herein and the requirements of Applicable Code and Standards, Vendor shall seek clarification from Contractor for his approval. In general, the most stringent condition shall apply.

4. Engineering Data

4.1 Identification System for Pipe Classes

Pipe class naming is based on PDP “398100-PMS” (UOP Pipe Classes). For piping classes that are not based on the PDP PMS, IPS-E-PI-221(2):2021 / INSO 22974:1400 is considered.

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	11 of 216

General Pipe Classes Identification follows a five-character system (fifth character is optional; if required).

The first character identifies the Base Material.

The second character identifies the Flange Rating Class.

The third character identifies the Fluid Category.

The fourth character identifies the Corrosion Allowance.

The fifth character (modifier) identifies a special requirement for pipe class.

1 st Character: Base Material		2 nd Character: Flange Rating Class		3 rd Character: Flange Facing		4 th Character: Corrosion Allowance		5 th Character: Modifier	
B	KCS	1	150	A	Raised Face (RF)	0	0 mm	N	NACE MR0103
E	1 ¹ / ₄ Cr 1 ¹ / ₂ Mo	2	300	C	Ring Joint (RJ)	1	1.5 mm	Q	PWHT
N	304/304L	4	600	D	Flat Face (FF)	2	3 mm	U	Under-Ground
M	316/316L	5	900			4	6 mm	S	Special
R	Monel 400	6	1500						
T	LTCS								
C	CPVC								

4.2 Pipes

Pipe dimension shall be in accordance with ASME B36.10M for welded and SMLS wrought steel pipes and to ASME B36.19M for stainless steel pipes.

All pipe threads shall conform to American standard taper as per ASME B1.20.1, unless otherwise specified.

BW ends shall conform to ASME B16.25.



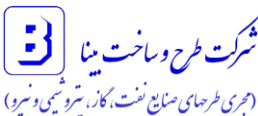

4.3 Flanges

Flanges shall be in accordance with the following codes:

Up to 24" Size ASME B16.5

Above 24" Size ASME B16.47-B

Steel flange faces shall have serration (concentric or spiral) as per MSS-SP-6, unless otherwise noted. Smooth face finish for RF shall be 125-250 micro inch.

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	Piping Material Specification							
MC : <div> APG</div>	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	12 of 216

BW ends of weld neck flanges shall be conformed to ASME B16.25 and bore of socket weld flanges shall be to suit pipe O.D. and its thickness.

Threads for screwed flanges shall conform to American standard taper as per ASME B1.20.1, unless otherwise stated.

4.4 Valves

Face to face dimension of flanged valves shall conform to ASME B16.10 to the extent covered. For valves not covered in the ASME specification, vendor to furnish certified dimension drawings. Flange dimensions of carbon, alloy and stainless steel flanged valves shall conform to ASME B16.5 for sizes up to 24" and ASME B16.47-B for sizes 26" and above, unless otherwise specified. BW ends of BW valves shall conform to ASME B 16.25.

Unless otherwise stated, geared operation for valves shall be furnished for the following sizes:

- Gate Valves:

150#	14" and over
300#	14" and over
600#	12" and over
900#	8" and over
1500#	6" and over
2500#	3" and over

- Globe valves:

150# and 300#	8" and over
600# and 900#	6" and over
1500#	4" and over
2500#	3" and over

- Ball valves:

150#,300# and 600#	6" and over
900#,1500#	4" and over
2500#	3" and over

- Plug valves:

150# and 300#	6" and over
---------------	-------------

- Butterfly valves

150#,300#	6" and over
-----------	-------------

The term "Stellite" wherever specified for valves shall have min. hardening to 500 Brinell.

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	Piping Material Specification							
MC : <div></div>	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	13 of 216

4.5 Fittings

Threaded joints shall conform to American standard taper as per ASME B1.20.1, unless otherwise specified.

Dimensions of socket weld and threaded fittings shall conform to ASME B16.11.

Dimensions of BW fittings shall conform to ASME B16.9.

BW ends shall conform to ASME B16.25.

In general, BW elbows shall be Long Radius type, $R=1.5D$, unless otherwise specified.

Weldolet, sockolet and threadolet dimensions shall conform to MSS-SP-97.

Length of nipples shall be 100 mm, unless otherwise stated.

4.6 Gaskets

Non-metallic gaskets shall conform to ASME B16.21, for sizes up to 24" as per ASME B16.5 and sizes 26" and above shall be as per ASME B16.47-B.

Spiral wound gaskets shall conform to ASME B16.20, for sizes up to 24" as per ASME B16.5 and to ASME B16.47-B for sizes 26" and above.

4.7 Bolting

Bolting shall conform to ASME B 18.2.1 and B18.2.2.

Nuts for bolts and studs shall be the American standard Hexagon heavy series.



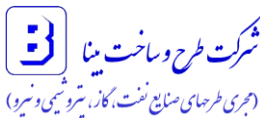

4.8 NACE Requirements

Wet H₂S Service: Where "Wet H₂S Service" has been considered in the document both SSC requirement based on BS EN ISO 17945-2015 and HIC requirement based on BS EN ISO 15156-2020 shall be considered in parallel.



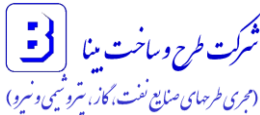

5. Line Class Index

General Pipe Classes (PDP-UOP)					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
B1A1	KCS	150	1.5	N-Butane, Isobutane, N ₂ , Air, DMDS, Propylene, Propane, C ₄ , Product Gas, Sealing Gas, H ₂ , N ₂ , Wet Flare, Wash Out Oil, Propylene, Propane, Isobutane, Cooling	



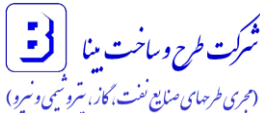

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	14 of 216

General Pipe Classes (PDP-UOP)					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
				Water , Cat, Flare Gas, Lift Gas, Neutralization Solution, CCR Special Instrument Air, Waste Water, Methanol, Solvent, Oil Mist, Atmospheric Vent, Fuel Gas	
B1A1U	KCS	150	1.5	Close Drain Header (UG), Cooling Water Return (UG), Cooling Water Supply (UG), Sanitary, Fire Water (UG)	
B1A2	KCS	150	3.0	H2, Propane, Propylene, Butane	
B1A2Q	KCS	150	3.0	10%NaOH, 30%NaOH , 50%NaOH , wash water	Yes
B1A2QU	KCS	150	3.0	10%NaOH(UG),30%NaOH (UG), 50%NaOH(UG) , wash water (UG)	Yes
B1A4	KCS	150	6.0	DMDS	
B2A1	KCS	300	1.5	N2, Product Gas, Propane, H2, Propylene, Ethane, Methane, Hydrocarbon, C3, C4, Desiccant, Isobutane, Propane, Isobutylene, Isobutane, Butane, Propylene, Methanol, Heavy Aromatics, Washing Oil (Buried), Solvent	
B2A2	KCS	300	3.0	Propylene, Propane, Isobutane, H2 , Hydrocarbon	
B2A2Q	KCS	300	3.0	10%NaOH, 30%NaOH , 50%NaOH , wash water	Yes



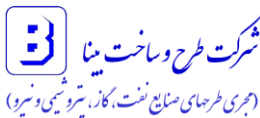

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	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	15 of 216

General Pipe Classes (PDP-UOP)					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
B4A1	KCS	600	1.5	Propylene, Propane, H2, C4, Hydrocarbon	
B4A2	KCS	600	3.0	N2	
B4A3	KCS	600	5.0	H2	
C1D0	CPVC	150	0	Hypochlorite sodium	
E2A1	AS (1 ¹ / ₄ Cr 1 ¹ / ₂ Mo)	300	1.5	Regeneration Gas, Air, Cl	Yes
M1A1	316/316L	150	1.5	DMDS corrosive media, CHEMICALS	
M2A1	316/316L	300	1.5	C4	
M3A1	316/316L	600	1.5	Phosphate solution (gas bag dosing line)	
N1A1	304/304L	150	1.5	LPG/H2, FG (Fuel Gas)	
PR-43-S	316/316L	300	1.5	Cat	
R1A1	Monel 400	150	1.5	Corrosive Medium	
T1A1	LTCS	150	1.5	Flare	
T2A1	LTCS	300	1.5	Ethane, Propylene, Ethylene	
AS-12 (DELETED)	AS (1 ¹ / ₄ Cr 1 ¹ / ₂ Mo)	300	1.5	High Pressure Steam	Yes
AS-13	KCS	600	1.5	High Pressure Steam, Steam, High Pressure Steam Condensate, BFW	
AS-16	AS (1 ¹ / ₄ Cr 1 ¹ / ₂ Mo)	600	1.5	High Pressure Steam	Yes

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	16 of 216



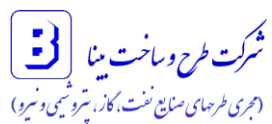

NACE Pipe Classes					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
B1A2N	KCS	150	3.0	H2, Sulfur-Containing Alkaline Solution	Yes
B2A2N	KCS	300	3.0	Propane, H2S, Water	Yes
B4A2N	KCS	600	3.0	Propane, H2S, Water	Yes

Miscellaneous Utilities					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
MS-1	KCS	150	1.5	Circulating Water, Industrial Water, Domestic Water, Fire Water, PA, Air	
MS-2	Galv CS	150	0.0	Instrument Air, Domestic Water, Fire Water (Tank Area Spray)	
MS-2U	Galv CS	150	0.0	Potable Water (UG)	
MS-5	SS 304/304L	150	1.5	Desalted Water, Lubricants, Demineralized Water	
MS-5U	GRVE	150	0	Desalted Water(UG), Desalinated Water(UG)	
MS-7	SS 316	800psig	0	Tubing	
MS-11	KCS	150	1.5	Low Pressure Steam, Low Pressure Steam Condensate	
MS-12	KCS	300	1.5	Medium Pressure Steam, Medium Pressure Steam Condensate	
MS-13	KCS	600	1.5	High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water	
MS-16	AS (1¼Cr ½ Mo)	600	1.5	High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water	Yes

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	17 of 216

Oleflex					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
OL-1	SS 304H	300	1.5	Propane, H ₂ , Isobutane, Propylene, Dry Gas	
OL-5	SS 304/304L	150	1.5	H ₂ , Flare, Propane	
OL-6	SS 304/304L	300	1.5	Methane, Ethane, Propane, Dry Flare Gas, Ethylene	
OL-7	SS 304/304L	600	1.5	Propane, Isobutane, Isobutene, Propylene	

CCR Regenerator Section-Oleflex					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
OR-1	SS 304H	300	1.5	H ₂ , Cat	
OR-2	SS 304/304L	150	2.5	N ₂ , H ₂ , Cat	
OR-3	AS (1 ¹ / ₄ Cr 1 ¹ / ₂ Mo)	150	2.5	N ₂ , Cat, H ₂	
OR-4	SS 304/304L	150	2.5	Cat, Lift gas	
OR-5	Inconel 600	150	1.5	IA, CL ₂ , CO ₂	
OR-6	SS 304/304L	150	2.5	Gas, Cat	
OR-8	SS 304/304L	150	1.5	Cat, N ₂	
OR-10	SS 304/304L	300	2.5	Catalyst with Hydrogen	
OR-11	SS 304/304L	150	1.5	Cat	
OR-12	SS 304H	300	1.5	Air	
OR-17	Inconel 600	300	1.5	Regeneration Gas Chlorine Gas, Regeneration Gas	



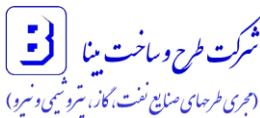

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	18 of 216

CCR Regenerator Section-Platforming					
Pipe Class	Base Material	Rating	C.A. (mm)	Service	PWHT
PR-1	AS (1 ¹ / ₄ Cr 1 ¹ / ₂ Mo)	300	1.5	Cat、Regeneration Gas	Yes
PR-3	KCS	150	-	Catalyst	
PR-36	SS 316H	300	1.5	Instrument Air, Chlorine Gas	




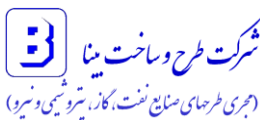
6. Abbreviation

AMB	Ambient
ATM	Atmosphere
BB	Bolted Bonnet
BC	Bolted Cover
BE	Beveled End
BLE	Beveled Large Ends
BLE/PSE	Bevel Large End , Plain Small End
BLE/TSE	Bevel Large End , MNPT Small End
BW	Butt Welded
C.A.	Corrosion Allowance (including erosion)
Conc.	Concentric
CS	Carbon Steel
CHM	Chemicals
DW	Demineralized Water
DIA	Diameter
EFW	Electric Fusion Welded
ERW	Electric Resistance Welded
Ecc.	Eccentric
FF	Flat Face or Full Face
FNPT	Female national taper Pipe Threads
GALV	Galvanized
GO	Gear Operated
HO	Hand Operated
KCS	Killed Carbon Steel
LTCS	Low Temperature Carbon Steel
LOL	Latrollet
LR	Long Radius
Longitudinal Seam	Long. Seam
Mfr.	Manufacturer
MNPT	Male national taper Pipe Threads



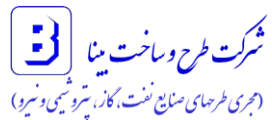

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	19 of 216

NBR	Nitrile Butadiene Rubber
NPS	Nominal Pipe Size
NPT	National Taper Pipe Threads
OS&Y	Outside Screw and Yoke
PBE	Plain Both Ends
PE	Plain End
POE / TOE	Plain One End, Threaded Male One End
PLE	Plain Large End
PSE	Plain Small End
RF	Raised Face
RT	Radiography Test
SCH	Schedule No.
SOL	Sockolet
SS	Stainless Steel
SMLS	Seamless
SW	Socket Welded
TBE	Threaded Both Ends
TOE	Thread One End
TEE	Equal Tee
TER	Reduced Tee
TLE	Lateral Tee Equal
TLR	Lateral Tee Reduced
TOL	Threadolet
TRP	Pipe to Pipe with Reinforced Pad
WOL	Weldolet



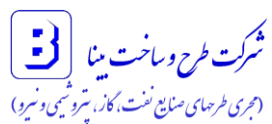

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	Piping Material Specification						 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
Document Number:	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.	Rev.:	Page
	3981-00-DE-PI-SPC-001						01	20 of 216

7. Pipe Classes

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	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	21 of 216



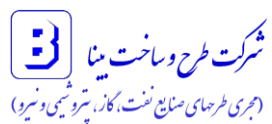

PIPING CLASS:		B1A1					
Design Code:		ASME B31.3		Base Material:		Carbon Steel	
Flange Rating & Facing:		150#	RF	Trim Material:		Trim No.: CN 8	
Corrosion Allowance:		1.5 mm		PWHT:		No	
Service:		N-Butane, Isobutane, N2、 Air, DMDS,Propylene、 Propane、 C4, Product Gas,Sealing Gas, H2, N2, Wet Flare, Wash Out Oil, Propylene、 Propane、 Isobutane, Cooling Water , Cat, Flare Gas, Lift Gas, Neutralization Solution, CCR Special Instrument Air, Waste Water, Methanol, Solvent, Oil Mist, Atmospheric Vent, Fuel Gas					
Design Temperature(° C):		-29 to 38	50	100	150	200	250
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1
PIPE							
PIPE	1/2"	1 1/2"	Pipe,SMLS, PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,				
PIPE	2"	14"	Pipe,SMLS, BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,				
PIPE	16"	36"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,SCH STD,				
PIPE	38"	48"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,SCH XS,				
PIPE	50"	60"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,THK. 15.88 mm,				
PIPE	62"	72"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,THK. 17.48 mm,				
PIPE	76"	80"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,THK. 19.05 mm,				
FITTING							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,				
FITTING	2"	14"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,				
FITTING	16"	36"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,				
FITTING	38"	48"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,				
FITTING	50"	60"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,THK. 15.88 mm,				
FITTING	62"	72"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,				
FITTING	76"	80"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,				
FITTING	2"	14"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,				
FITTING	16"	36"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,				
FITTING	38"	48"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,				
FITTING	50"	60"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,THK. 15.88 mm,				
FITTING	62"	72"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,				
FITTING	76"	80"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,				
FITTING	2"	2"	Elbow-90 SR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,				
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,				

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	22 of 216





PIPING CLASS:			B1A1					
Design Code:			ASME B31.3		Base Material:		Carbon Steel	
Flange Rating & Facing:			150#	RF		Trim Material:		Trim No.: CN 8
Corrosion Allowance:			1.5 mm			PWHT:		No
Service:			N-Butane, Isobutane, N2、 Air, DMDS,Propylene、 Propane、 C4, Product Gas,Sealing Gas, H2, N2, Wet Flare, Wash Out Oil, Propylene、 Propane、 Isobutane, Cooling Water , Cat, Flare Gas, Lift Gas, Neutralization Solution, CCR Special Instrument Air, Waste Water, Methanol, Solvent, Oil Mist, Atmospheric Vent, Fuel Gas					
Design Temperature(°C):			-29 to 38	50	100	150	200	250
Design Pressure(Barg):			19.6	19.2	17.7	15.8	13.8	12.1
FITTING	2"	14"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	16"	36"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	38"	48"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	50"	60"	Cap, SMLS,BW,ASTM A234 WPB,MSS SP-75,THK. 15.88 mm,					
FITTING	62"	72"	Cap, SMLS,BW,ASTM A234 WPB,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,					
FITTING	76"	80"	Cap, SMLS,BW,ASTM A234 WPB,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,					
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,					
FITTING	1/2"	1 1/2"	Latrolet,45 DEG,Forged,SW,ASTM A105,MSS SP-97,Class 3000,					
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,					
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,					
FITTING	3"	14"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,					
FITTING	16"	48"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,					
FITTING	50"	60"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,					
FITTING	62"	80"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),					
FITTING	3"	14"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,					
FITTING	16"	48"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,					
FITTING	50"	60"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,					
FITTING	62"	80"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS, BLE/PSE,ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	23 of 216



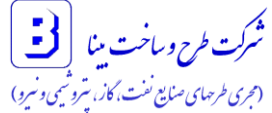

PIPING CLASS:			B1A1					
Design Code:			ASME B31.3		Base Material:		Carbon Steel	
Flange Rating & Facing:			150#	RF	Trim Material:		Trim No.: CN 8	
Corrosion Allowance:			1.5 mm		PWHT:		No	
Service:			N-Butane, Isobutane, N2、 Air, DMDS,Propylene、 Propane、 C4, Product Gas,Sealing Gas, H2, N2, Wet Flare, Wash Out Oil, Propylene、 Propane、 Isobutane, Cooling Water , Cat, Flare Gas, Lift Gas, Neutralization Solution, CCR Special Instrument Air, Waste Water, Methanol, Solvent, Oil Mist, Atmospheric Vent, Fuel Gas					
Design Temperature(°C):			-29 to 38	50	100	150	200	250
Design Pressure(Barg):			19.6	19.2	17.7	15.8	13.8	12.1
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm, SMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm, SMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	14"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	16"	36"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,					
FITTING	38"	48"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,					
FITTING	50"	60"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,THK. 15.88 mm,					
FITTING	62"	72"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,					
FITTING	76"	80"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,					
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	14"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	2"	14"	Lateral Tee-Reducing, 45 DEG, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	16"	36"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,					
FITTING	38"	48"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,					
FITTING	50"	60"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,THK. 15.88 mm,					
FITTING	62"	72"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,					
FITTING	76"	80"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,					
FLANGE								
FLANGE	1/2"	24"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.5,					
FLANGE	26"	60"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.47 Serial B,					
FLANGE	62"	64"	Flange, Blind,Class E,FF,ASTM A105,Mfr Std. (with ref. to AWWA C207),					
FLANGE	66"	78"	Flange, Blind,Class E,FF,ASTM A105,AWWA C207,					
FLANGE	80"	80"	Flange, Blind,Class E,FF,ASTM A105,Mfr Std. (with ref. to AWWA C207),					
FLANGE	1/2"	24"	Flange, Blind,CL 300,RF,ASTM A105,ASME B16.5,					
FLANGE	26"	60"	Flange, Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,					
FLANGE	1/2"	1 1/2"	Flange, SW,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,					
FLANGE	2"	24"	Flange, WN,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,					
FLANGE	26"	60"	Flange, WN,CL 150,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	24 of 216



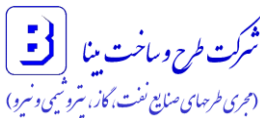

PIPING CLASS:		B1A1						
Design Code:		ASME B31.3			Base Material:		Carbon Steel	
Flange Rating & Facing:		150#	RF		Trim Material:		Trim No.: CN 8	
Corrosion Allowance:		1.5 mm			PWHT:		No	
Service:		N-Butane, Isobutane, N2, Air, DMDS,Propylene、 Propane、 C4, Product Gas,Sealing Gas, H2, N2, Wet Flare, Wash Out Oil, Propylene、 Propane、 Isobutane, Cooling Water , Cat, Flare Gas, Lift Gas, Neutralization Solution, CCR Special Instrument Air, Waste Water, Methanol, Solvent, Oil Mist, Atmospheric Vent, Fuel Gas						
Design Temperature(°C):		-29 to 38	50	100	150	200	250	
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	
FLANGE	62"	64"	Flange, Hub Type, CL E,FF,ASTM A105, Mfr. Std. (with ref. to AWWA C207),					
FLANGE	66"	78"	Flange, Hub Type, CL E,FF,ASTM A105,AWWA C207,					
FLANGE	80"	80"	Flange, Hub Type, CL E,FF,ASTM A105, Mfr. Std. (with ref. to AWWA C207),					
FLANGE	1/2"	1 1/2"	Flange, SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,					
FLANGE	2"	24"	Flange, WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,					
FLANGE	26"	60"	Flange, WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,					
BLIND								
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,					
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,					
BLINDS	26"	60"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022/3981-00-BA-PI-DSH-056,					
BLINDS	66"	78"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project data sheet. 3981-00-BA-PI-DSH-056					
BLINDS	1/2"	14"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,					
BLINDS	16"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,					
BLINDS	26"	60"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,					
GASKET								
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,					
GASKET	26"	60"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,					
GASKET	62"	80"	Flat Ring Gasket,CL E,For Use With FF Flange,PTFE,AWWA C207,/Mfr. Std. (where flange Std. is the MAN. STD),4.5 mm,					
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,					
GASKET	26"	60"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,					
BOLT & NUT								
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,					
VALVE								
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton ,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,					
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton ,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO.					

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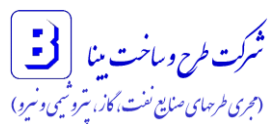

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی و طراحی)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	25 of 216

PIPING CLASS:		B1A1					
Design Code:		ASME B31.3			Base Material:		Carbon Steel
Flange Rating & Facing:		150#	RF		Trim Material:		Trim No.: CN 8
Corrosion Allowance:		1.5 mm			PWHT:		No
Service:		N-Butane, Isobutane, N2, Air, DMDS,Propylene、Propane、C4, Product Gas,Sealing Gas, H2, N2, Wet Flare, Wash Out Oil, Propylene、Propane、Isobutane, Cooling Water , Cat, Flare Gas, Lift Gas, Neutralization Solution, CCR Special Instrument Air, Waste Water, Methanol, Solvent, Oil Mist, Atmospheric Vent, Fuel Gas					
Design Temperature(°C):		-29 to 38	50	100	150	200	250
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO,				
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,				
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800, ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,THRD ASME B16.11,Self Operated,				
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,				
VALVE	2"	24"	CHECK VALVE DUAL PLATE, ,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.5,Self Operated,				
VALVE	26"	52"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,				
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,				
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800, SW/FNPT,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,				
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API600,FLANGED ASME B16.5,HO,				
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,				
VALVE	26"	60"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,				
VALVE	64"	68"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED Mfr. Std.,GO,				
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,				
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,				
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,				
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW,ASTM A105,TRIM: CN12 (AS PER API 600), MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,SW ASME B16.11,HO,MFR				
VALVE	2"	14"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,FLANGED ASME B16.5,HO,				

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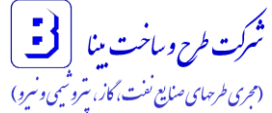
OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	26 of 216

PIPING CLASS:			B1A1					
Design Code:			ASME B31.3		Base Material:		Carbon Steel	
Flange Rating & Facing:			150#	RF	Trim Material:		Trim No.: CN 8	
Corrosion Allowance:			1.5 mm		PWHT:		No	
Service:			N-Butane, Isobutane, N2, Air, DMDS, Propylene, Propane, C4, Product Gas, Sealing Gas, H2, N2, Wet Flare, Wash Out Oil, Propylene, Propane, Isobutane, Cooling Water , Cat, Flare Gas, Lift Gas, Neutralization Solution, CCR Special Instrument Air, Waste Water, Methanol, Solvent, Oil Mist, Atmospheric Vent, Fuel Gas					
Design Temperature(°C):			-29 to 38	50	100	150	200	250
Design Pressure(Barg):			19.6	19.2	17.7	15.8	13.8	12.1
VALVE	3"	4"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB, SHAFT:13Cr, DISC: SS 304, SEAT: PTFE, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,HO,					
VALVE	6"	34"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150,WAFER / LUG ASME B16.5 (26" AND ABOVE SIZES ASME B16.47-B SERIES),ASTM A216 WCB, SHAFT:13Cr, DISC: SS 304, SEAT: PTFE, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,					
VALVE	36"	60"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150, DOUBLE- FLANGED,RF, ASME B16.47-B,ASTM A216 WCB, SHAFT:13Cr, DISC: SS 304, SEAT: PTFE,All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,					
VALVE	66"	72"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150B AS PER AWWA C504 SUITABLE TO BE USED BETWEEN FF FLANGES OF AWWA C 207 CLASS E, DOUBLE- FLANGED, FF,ASTM A216 WCB, SHAFT:13Cr, DISC: SS 304, SEAT: EPDM , ASTM A193 Gr.B7 / ASTM A194 Gr.2H, AWWA C504,GO,					
VALVE	78"	78"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150B AS PER AWWA C516 SUITABLE TO BE USED BETWEEN FF FLANGES OF AWWA C 207 CLASS E, DOUBLE- FLANGED, FF, ASTM A216 WCB, SHAFT:13Cr. DISC: SS 304, SEAT: EPDM ,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H, AWWA C516.GO,					

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification	CONTRACTOR/CONSULTANT:  											
							MC : 					
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.						
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 27 of 216				



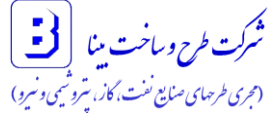

PIPING CLASS:		B1A1U						
Design Code:		ASME B31.3		Base Material:		Carbon steel		
Flange Rating & Facing:		150#		RF		Trim Material	Trim No. CN 8	
Corrosion Allowance:		1.5 mm		PWHT:		No		
Service:		Close Drain Header (UG), Cooling Water Return (UG), Cooling Water Supply (UG), Sanitary, Fire Water(UG)						
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
PIPE								
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,					
PIPE	2"	14"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,					
PIPE	16"	36"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,SCH STD,					
PIPE	38"	48"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,SCH XS,					
PIPE	50"	60"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,THK. 15.88 mm,					
PIPE	64"	72"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,THK. 17.48 mm,					
PIPE	76"	80"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M,THK. 19.05 mm,					
FITTING								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	14"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	16"	36"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,					
FITTING	38"	48"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,					
FITTING	50"	60"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,THK. 15.88 mm,					
FITTING	64"	72"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,					
FITTING	76"	80"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	14"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	16"	36"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,					
FITTING	38"	48"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,					
FITTING	50"	60"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,THK. 15.88 mm,					
FITTING	64"	72"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,					
FITTING	76"	80"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,					
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	14"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	16"	36"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	38"	48"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	50"	60"	Cap. SMLS,BW,ASTM A234 WPB,MSS SP-75,THK. 15.88 mm.					

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OWNER:  Pars Petrochemical Co. MC : 	PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification						CONTRACTOR/CONSULTANT:  	
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
							Rev.:	Page
Document Number:	3981-00-DE-PI-SPC-001						01	28 of 216



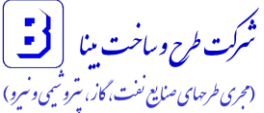

PIPING CLASS:			B1A1U						
Design Code:			ASME B31.3		Base Material:		Carbon steel		
Flange Rating & Facing:			150#		RF		Trim Material	Trim No. CN 8	
Corrosion Allowance:			1.5 mm		PWHT:		No		
Service:			Close Drain Header (UG), Cooling Water Return (UG), Cooling Water Supply (UG), Sanitary, Fire Water(UG)						
Design Temperature(°C):			-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):			19.6	19.2	17.7	15.8	13.8	12.1	10.2
FITTING	64"	72"	Cap, SMLS,BW,ASTM A234 WPB,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,						
FITTING	76"	80"	Cap, SMLS,BW,ASTM A234 WPB,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,						
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,						
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,						
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,						
FITTING	3"	14"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,						
FITTING	16"	48"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,						
FITTING	50"	80"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75/Mfr standard,						
FITTING	3"	14"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,						
FITTING	16"	48"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,						
FITTING	50"	80"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75/Mfr standard,						
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,						
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,						
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,						
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,						
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,						
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,						
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,						
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,						
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,						
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,						
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,						
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,						
FITTING	2"	14"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	16"	36"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,						
FITTING	38"	48"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,						
FITTING	50"	60"	Tee-Straight. Welded 100% RT.BW.ASTM A234 WPBW.MSS SP-75.THK. 15.88 mm.						

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	29 of 216



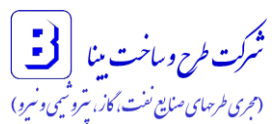

PIPING CLASS:			B1A1U						
Design Code:			ASME B31.3		Base Material:		Carbon steel		
Flange Rating & Facing:			150#		RF		Trim Material		Trim No. CN 8
Corrosion Allowance:			1.5 mm		PWHT:		No		
Service:			Close Drain Header (UG), Cooling Water Return (UG), Cooling Water Supply (UG), Sanitary, Fire Water(UG)						
Design Temperature(°C):			-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):			19.6	19.2	17.7	15.8	13.8	12.1	10.2
FITTING	64"	72"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,						
FITTING	76"	80"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,						
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,						
FITTING	2"	14"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	16"	36"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,						
FITTING	38"	48"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,						
FITTING	50"	60"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,MSS SP-75,THK. 15.88 mm,						
FITTING	64"	72"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 17.48 mm,						
FITTING	76"	80"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,Mfr. Std. (with ref. to MSS SP-75),THK. 19.05 mm,						
FLANGE									
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A105,ASME B16.5,						
FLANGE	26"	60"	Flange,Blind,CL 150,RF,ASTM A105,ASME B16.47 Serial B,						
FLANGE	64"	64"	Flange,Blind,CL E,FF,ASTM A105, Mfr Std. (With ref. to AWWA C207),						
FLANGE	66"	78"	Flange,Blind,CL E,FF,ASTM A105, AWWA C207,						
FLANGE	80"	80"	Flange,Blind,CL E,FF,ASTM A105, Mfr Std. (With ref. to AWWA C207),						
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,						
FLANGE	26"	60"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B),						
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,						
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,						
FLANGE	26"	60"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,						
FLANGE	64"	64"	Flange,Hub Type,Class E,FF,ASTM A105, Mfr Std. (With ref. to AWWA C207),						
FLANGE	66"	78"	Flange,Hub Type,Class E,FF,ASTM A105,AWWA C207,						
FLANGE	80"	80"	Flange,Hub Type,Class E,FF,ASTM A105, Mfr Std. (With ref. to AWWA C207),						
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,						
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,						
FLANGE	26"	60"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,						
BLIND									
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,						
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,						
BLINDS	26"	60"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022.						

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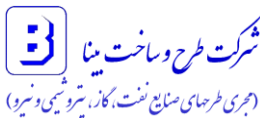

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	30 of 216

PIPING CLASS:			B1A1U						
Design Code:			ASME B31.3		Base Material:		Carbon steel		
Flange Rating & Facing:			150#		RF		Trim Material		Trim No. CN 8
Corrosion Allowance:			1.5 mm		PWHT:		No		
Service:			Close Drain Header (UG), Cooling Water Return (UG), Cooling Water Supply (UG), Sanitary, Fire Water(UG)						
Design Temperature(°C):			-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):			19.6	19.2	17.7	15.8	13.8	12.1	10.2
BLINDS	64"	66"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,Mfr Std.(To match AWWA C207 CLE Flanges)						
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,						
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,						
BLINDS	26"	60"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,						
GASKET									
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,						
GASKET	26"	60"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,						
GASKET	64"	80"	Flat Ring Gasket,CL 150,For Use With FF Flange,PTFE,AWWA C207, /Mfr Std ,3.2 mm,						
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,						
GASKET	26"	60"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,						
BOLT & NUT									
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,						
VALVE									
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,						
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,						
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO,						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,THRD ASME B16.11,Self Operated,						
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,						
VALVE	26"	30"	CHECK VALVE / RETAINERLESS VALVE, DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,THRD ASME B16.11,HO,						

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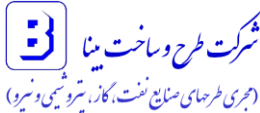
OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	31 of 216

PIPING CLASS:		B1A1U						
Design Code:		ASME B31.3		Base Material:		Carbon steel		
Flange Rating & Facing:		150#		RF		Trim Material		Trim No. CN 8
Corrosion Allowance:		1.5 mm		PWHT:		No		
Service:		Close Drain Header (UG), Cooling Water Return (UG), Cooling Water Supply (UG), Sanitary, Fire Water(UG)						
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,					
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,					
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,					
VALVE	26"	60"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,					
VALVE	64"	68"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED Mfr. Std.,GO,					
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,					
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,THRD ASME B16.11,HO,					
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,					
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,					
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW,ASTM A105,TRIM: CN12 (AS PER API 600),All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,SW ASME B16.11,HO,					
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,ASTM A105,TRIM: CN12 (AS PER API 600),All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,THRD ASME B16.11,HO,					
VALVE	2"	14"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,FLANGED ASME B16.5,HO,					
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6 ,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,HO,					
VALVE	6"	24"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6,All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,MFR					
VALVE	26"	30"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.47B,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	32 of 216



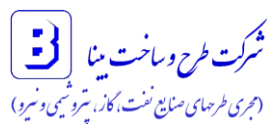

PIPING CLASS:		B1A2								
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel			
Flange Rating & Facing:		150#			RF		Trim Material:		Trim No.: CN 8	
Corrosion Allowance:		3mm			PWHT:			No		
Service:		H2, Propane、 Propylene、 Butane								
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
PIPE										
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH 160,							
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,							
PIPE	3"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,							
PIPE	8"	12"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 30,							
PIPE	14"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,							
PIPE	18"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,SCH STD,							
PIPE	26"	30"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,SCH XS,							
FITTING										
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	3"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	8"	12"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	14"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	26"	30"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	3"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	8"	12"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	14"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	26"	30"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,							
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	3"	6"	Cap. SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD.							

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OWNER:  MC : 	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	33 of 216



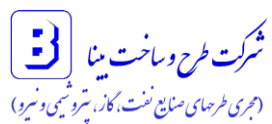

PIPING CLASS:		B1A2								
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		150#				RF		Trim Material:		Trim No.: CN 8
Corrosion Allowance:		3mm				PWHT:			No	
Service:		H2, Propane, Propylene, Butane								
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
FITTING	8"	12"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	14"	16"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	26"	30"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 6000,							
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 6000,							
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,							
FITTING	3"	16"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	18"	30"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,							
FITTING	3"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	18"	30"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	3"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	8"	12"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	14"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	24"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							

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OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	34 of 216



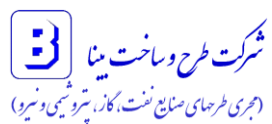

PIPING CLASS:		B1A2								
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		150#				RF		Trim Material:		Trim No.: CN 8
Corrosion Allowance:		3mm				PWHT:			No	
Service:		H2, Propane、 Propylene、 Butane								
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
FITTING	26"	30"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,							
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	3"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	8"	12"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	14"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	26"	30"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,							
FLANGE										
FLANGE	1/2"	24"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.5,							
FLANGE	26"	30"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.47 Serial B,							
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,							
FLANGE	26"	30"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	30"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	30"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
BLIND										
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	26"	30"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,							
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	26"	30"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,							
GASKET										
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
GASKET	26"	30"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B 4.5 mm.							

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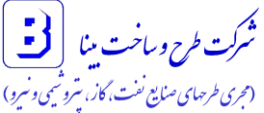

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	35 of 216

PIPING CLASS:		B1A2								
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		150#				RF		Trim Material:		Trim No.: CN 8
Corrosion Allowance:		3mm				PWHT:			No	
Service:		H2, Propane, Propylene, Butane								
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
GASKET	26"	30"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,							
BOLT & NUT										
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,							
VALVE										
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,							
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,							
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO,							
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,							
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,							
VALVE	26"	30"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT ASME B16.11,HO,							
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,							
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,							
VALVE	26"	30"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,							
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,							
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,							
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO.							

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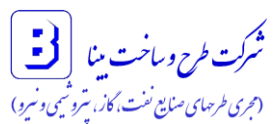

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	36 of 216

PIPING CLASS:		B1A2								
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		150#				RF		Trim Material:		Trim No.: CN 8
Corrosion Allowance:		3mm				PWHT:			No	
Service:		H2, Propane、 Propylene、 Butane								
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW,ASTM A105,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,SW ASME B16.11,HO,							
VALVE	2"	14"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,FLANGED ASME B16.5,HO,							
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,HO,							
VALVE	6"	24"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6,All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,							
VALVE	26"	30"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.47B,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6,All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO.							

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	37 of 216



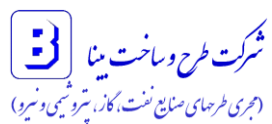

PIPING CLASS:		B1A2N						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		150#	RF		Trim Material:		Trim No.: CN 12	
Corrosion Allowance:		3mm			PWHT:		Yes	
Service:		H2、Sulfur-Containing Alkaline Solution						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
PIPE								
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH 160,					
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH XS,					
PIPE	3"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH STD,					
PIPE	8"	12"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH 30,					
PIPE	14"	24"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	3"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	8"	12"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH 30,					
FITTING	14"	24"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	3"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	8"	12"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH 30,					
FITTING	14"	24"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	3"	6"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	8"	16"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH 30,					
FITTING	18"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,					
FITTING	3"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,					
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	38 of 216



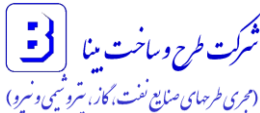

PIPING CLASS:		B1A2N						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		150#	RF		Trim Material:		Trim No.: CN 12	
Corrosion Allowance:		3mm			PWHT:		Yes	
Service:		H2、 Sulfur-Containing Alkaline Solution						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105N,MSS SP-83,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length: 100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length: 100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length: 100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,					
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	3"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	8"	12"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH 30,					
FITTING	14"	24"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	3"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FITTING	8"	12"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH 30,					
FITTING	14"	24"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH STD,					
FLANGE								
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,					
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,					
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	39 of 216

PIPING CLASS:		B1A2N						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		150#	RF		Trim Material:		Trim No.: CN 12	
Corrosion Allowance:		3mm			PWHT:		Yes	
Service:		H2、Sulfur-Containing Alkaline Solution						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,					
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,					
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,					
BLIND								
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70N,ASME B16.48,WET H2S SERVICE NACE MR0103,					
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70N,ASME B16.48,WET H2S SERVICE NACE MR0103,					
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70N,ASME B16.48,WET H2S SERVICE NACE MR0103,					
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70N,ASME B16.48,WET H2S SERVICE NACE MR0103,					
GASKET								
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,WET H2S SERVICE NACE MR0103,ASME B16.5,4.5 mm,					
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,WET H2S SERVICE NACE MR0103,ASME B16.5,4.5 mm,					
BOLT & NUT								
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,					
VALVE								
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105N,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,BS EN ISO 17292,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,					
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 608,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,					
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 602,SW ASME B16.11,Self Operated,WET H2S SERVICE NACE MR0103,					
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,BS 1868,FLANGED ASME B16.5,Self Operated,WET H2S SERVICE NACE MR0103,					
VALVE	2"	24"	CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7M/ASTM A194 Gr.2HM,API 594,ASME B16.5,Self Operated, WET H2S SERVICE NACE MR0103,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 602,SW ASME B16.11,HO,WET H2S SERVICE NACE MR0103,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 602, SW/FNPT, ASME B16.11,HO,WET H2S SERVICE NACE MR0103,					
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 600,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,					

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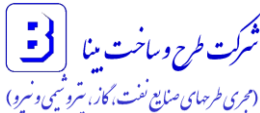

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	40 of 216

PIPING CLASS:		B1A2N						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		150#	RF		Trim Material:		Trim No.: CN 12	
Corrosion Allowance:		3mm			PWHT:		Yes	
Service:		H2、 Sulfur-Containing Alkaline Solution						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 600,FLANGED ASME B16.5,GO,WET H2S SERVICE NACE MR0103,					
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 602,SW ASME B16.11,HO,WET H2S SERVICE NACE MR0103,					
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,BS 1873,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,					
VALVE	8"	12"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,BS 1873,FLANGED ASME B16.5,GO,WET H2S SERVICE NACE MR0103,					
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600), BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 599,SW ASME B16.11,HO,WET H2S SERVICE NACE MR0103,					
VALVE	2"	4"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600), BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,API 599,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,					

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی و طراحی)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	41 of 216



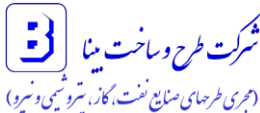

Piping Class:		B1A2Q							
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		150#		RF		Trim Material:		Trim No.: CN 10	
Corrosion Allowance:		3mm			PWHT:		Yes		
Service:		10%NaOH、 30%NaOH 、 50%NaOH , wash water							
Design Temperature(C):		-29 to 38			50		100		
Design Pressure(Barg):		19.6			19.2		17.7		
PIPE									
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M, SCH 160,						
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH XS,						
PIPE	3"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH STD,						
PIPE	8"	12"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH 30,						
PIPE	14"	16"	Pipe,SMLS,BE,ASTM A106 Gr.B,ASME B36.10M, SCH STD,						
PIPE	18"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,PWHT,SCH STD,						
PIPE	26"	30"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,PWHT,SCH XS,						
FITTING									
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11, Class 6000,						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,						
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,						
FITTING	3"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,						
FITTING	8"	12"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,						
FITTING	14"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9 ,SCH STD,						
FITTING	18"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH STD,						
FITTING	26"	30"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11, Class 6000,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,						
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9 ,SCH XS,						
FITTING	3"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	8"	12"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,						
FITTING	14"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	18"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH STD,						
FITTING	26"	30"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,						
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11, Class 6000,						
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,PWHT,Class 6000,						
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,						
FITTING	3"	6"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,						
FITTING	8"	12"	Cap. SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,						

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 42 of 216



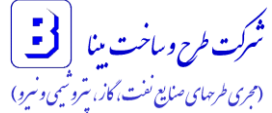

Piping Class:			B1A2Q			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:			3mm		PWHT:	Yes
Service:			10%NaOH、 30%NaOH 、 50%NaOH , wash water			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
FITTING	14"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	26"	30"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97, Class 6000,			
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97, Class 6000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,			
FITTING	3"	16"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,			
FITTING	18"	30"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,PWHT,ASME B16.9,			
FITTING	3"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9 ,			
FITTING	18"	30"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 6000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 6000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M, Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M, Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M, Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11, Class 6000,			
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,			
FITTING	3"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	8"	12"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,			
FITTING	14"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	18"	24"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT, SCH STD,			
FITTING	26"	30"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	43 of 216



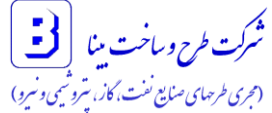

Piping Class:			B1A2Q			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:			3mm		PWHT:	Yes
Service:			10%NaOH、 30%NaOH 、 50%NaOH , wash water			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11, Class 6000,			
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,			
FITTING	3"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	8"	12"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,			
FITTING	14"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	18"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH STD,			
FITTING	26"	30"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,			
FLANGE						
FLANGE	1/2"	24"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.5,			
FLANGE	26"	30"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.47 Serial B,			
FLANGE	1/2"	24"	Flange, Blind,CL 300,RF,ASTM A105,ASME B16.5,			
FLANGE	26"	30"	Flange, Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,			
FLANGE	1/2"	1 1/2"	Flange, SW,CL 150,RF,ASTM A105,ASME B16.5, Same as pipe,			
FLANGE	2"	24"	Flange, WN,CL 150,RF,ASTM A105,ASME B16.5, Same as pipe,			
FLANGE	26"	30"	Flange, WN,CL 150,RF,ASTM A105,ASME B16.47 Serial B, Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange, SW,CL 300,RF,ASTM A105,ASME B16.5, Same as pipe,			
FLANGE	2"	24"	Flange, WN,CL 300,RF,ASTM A105,ASME B16.5, Same as pipe,			
FLANGE	26"	30"	Flange, WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B ,Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	26"	30"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,			
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	26"	30"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,			
GASKET						
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
GASKET	26"	30"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,			
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			

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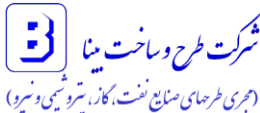

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسین مشاور)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	44 of 216

Piping Class:			B1A2Q			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:			3mm		PWHT:	Yes
Service:			10%NaOH、 30%NaOH 、 50%NaOH , wash water			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
GASKET	26"	30"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,			
VALVE						
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,PWHT,			
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,PWHT,			
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO,PWHT,			
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,PWHT,			
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT,			
VALVE	26"	30"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,PWHT,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,PWHT,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,PWHT,			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,PWHT,			
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,PWHT,			
VALVE	26"	30"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,PWHT,			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,PWHT,			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,PWHT,			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,PWHT,			

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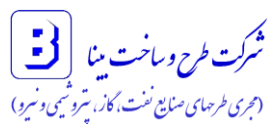

OWNER:  Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت  شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
MC :  APG	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	45 of 216

Piping Class:			B1A2Q			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:			3mm		PWHT:	Yes
Service:			10%NaOH、 30%NaOH 、 50%NaOH , wash water			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW,ASTM A105,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,SW ASME B16.11,HO,PWHT,			
VALVE	2"	14"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,FLANGED ASME B16.5,HO,PWHT,			
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,HO,PWHT,			
VALVE	6"	24"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,PWHT,			
VALVE	26"	30"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.47B,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6,All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,PWHT,			

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	46 of 216



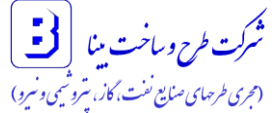

Piping Class:		B1A2QU							
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		150#		RF		Trim Material:		Trim No.: CN 10	
Corrosion Allowance:		3mm			PWHT:		Yes		
Service:		10%NaOH (UG)、 30%NaOH (UG) 、 50%NaOH (UG) , wash water (UG)							
Design Temperature(C):		-29 to 38			50		100		
Design Pressure(Barg):		19.6			19.2		17.7		
PIPE									
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M, SCH 160,						
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH XS,						
PIPE	3"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH STD,						
PIPE	8"	12"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH 30,						
PIPE	14"	16"	Pipe,SMLS,BE,ASTM A106 Gr.B,ASME B36.10M, SCH STD,						
PIPE	18"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,PWHT,SCH STD,						
PIPE	26"	30"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,PWHT,SCH XS,						
FITTING									
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11, Class 6000,						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,						
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,						
FITTING	3"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,						
FITTING	8"	12"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,						
FITTING	14"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9 ,SCH STD,						
FITTING	18"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH STD,						
FITTING	26"	30"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,PWHT,Class 6000,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,						
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9 ,SCH XS,						
FITTING	3"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	8"	12"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,						
FITTING	14"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	18"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH STD,						
FITTING	26"	30"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,						
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 6000,						
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,PWHT,Class 6000,						
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,						
FITTING	3"	6"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,						
FITTING	8"	12"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,						

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	47 of 216



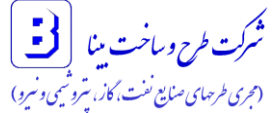

Piping Class:			B1A2QU			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:			3mm		PWHT:	Yes
Service:			10%NaOH (UG)、30%NaOH (UG)、50%NaOH (UG) , wash water (UG)			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
FITTING	14"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	26"	30"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97, Class 6000,			
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97, Class 6000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,			
FITTING	3"	16"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,			
FITTING	18"	30"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,			
FITTING	3"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9 ,			
FITTING	18"	30"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,PWHT,Class 6000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,PWHT,Class 6000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,PWHT,Class 6000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M, Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M, Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M, Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11, Class 6000,			
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,			
FITTING	3"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	8"	12"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,			
FITTING	14"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,			
FITTING	18"	24"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH STD,			
FITTING	26"	30"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,			

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	Piping Material Specification						CONTRACTOR/CONSULTANT:  	
	MC : 							
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 48 of 216



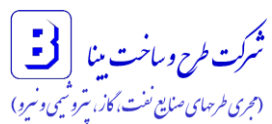

Piping Class:		B1A2QU			
Design Code:		ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:		150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:		3mm		PWHT:	Yes
Service:		10%NaOH (UG)、 30%NaOH (UG) 、 50%NaOH (UG) , wash water (UG)			
Design Temperature(C):		-29 to 38		50	100
Design Pressure(Barg):		19.6		19.2	17.7
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11, Class 6000,		
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,		
FITTING	3"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,		
FITTING	8"	12"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,		
FITTING	14"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,		
FITTING	18"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH STD,		
FITTING	26"	30"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,PWHT,SCH XS,		
FLANGE					
FLANGE	1/2"	24"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.5,		
FLANGE	26"	30"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.47 Serial B,		
FLANGE	1/2"	24"	Flange, Blind,CL 300,RF,ASTM A105,ASME B16.5,		
FLANGE	26"	30"	Flange, Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,		
FLANGE	1/2"	1 1/2"	Flange, SW,CL 150,RF,ASTM A105,ASME B16.5, Same as pipe,		
FLANGE	2"	24"	Flange, WN,CL 150,RF,ASTM A105,ASME B16.5, Same as pipe,		
FLANGE	26"	30"	Flange, WN,CL 150,RF,ASTM A105,ASME B16.47 Serial B, Same as pipe,		
FLANGE	1/2"	1 1/2"	Flange, SW,CL 300,RF,ASTM A105,ASME B16.5, Same as pipe,		
FLANGE	2"	24"	Flange, WN,CL 300,RF,ASTM A105,ASME B16.5, Same as pipe,		
FLANGE	26"	30"	Flange, WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B ,Same as pipe,		
BLIND					
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,		
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,		
BLINDS	26"	30"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,		
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,		
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,		
BLINDS	26"	30"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,		
GASKET					
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,		
GASKET	26"	30"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,		
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,		

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسین مشاور)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	49 of 216

Piping Class:			B1A2QU			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:			3mm		PWHT:	Yes
Service:			10%NaOH (UG)、30%NaOH (UG)、50%NaOH (UG) , wash water (UG)			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
GASKET	26"	30"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,			
VALVE						
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,PWHT,			
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,PWHT,			
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO,PWHT,			
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,PWHT,			
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT,			
VALVE	26"	30"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,PWHT,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,PWHT,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602, SW/FNPT, ASME B16.11,HO,PWHT,			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,PWHT,			
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,PWHT,			
VALVE	26"	30"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,PWHT,			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,PWHT,			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,PWHT,			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,PWHT,			

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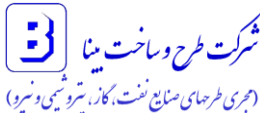

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	50 of 216

Piping Class:			B1A2QU			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Trim No.: CN 10
Corrosion Allowance:			3mm		PWHT:	Yes
Service:			10%NaOH (UG)、30%NaOH (UG) 、50%NaOH (UG) , wash water (UG)			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW,ASTM A105,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,SW ASME B16.11,HO,PWHT,			
VALVE	2"	14"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,FLANGED ASME B16.5,HO,PWHT,			
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,HO,PWHT,			
VALVE	6"	24"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,PWHT,			
VALVE	26"	30"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.47B,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6,All MNFR,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,PWHT,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	51 of 216



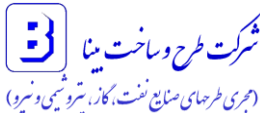

Piping Class:	B1A4								
Design Code:	ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:	150#	RF			Trim Material:			Trim No.:CN 8	
Corrosion Allowance:	6mm				PWHT:			No	
Service:	DMDS								
Design Temperature(C):	-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):	19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
PIPE									
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XXS,						
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XXS,						
PIPE	3"	3"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 160,						
PIPE	4"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,						
PIPE	8"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 60,						
PIPE	10"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,						
PIPE	12"	12"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,						
PIPE	14"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,						
PIPE	18"	18"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 30,						
FITTING									
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 9000,						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 9000,						
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XXS,						
FITTING	3"	3"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,						
FITTING	4"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,						
FITTING	8"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 60,						
FITTING	10"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	12"	12"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,						
FITTING	14"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	18"	18"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 9000,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 9000,						
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XXS,						
FITTING	3"	3"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,						
FITTING	4"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,						
FITTING	8"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 60,						
FITTING	10"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	12"	12"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,						
FITTING	14"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	52 of 216



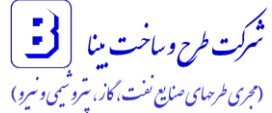

Piping Class:		B1A4								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		150#		RF		Trim Material:			Trim No.:CN 8	
Corrosion Allowance:		6mm				PWHT:			No	
Service:		DMDS								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
FITTING	18"	18"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 9000,							
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 9000,							
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XXS,							
FITTING	3"	3"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,							
FITTING	4"	6"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	8"	8"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 60,							
FITTING	10"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	12"	12"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	14"	16"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	18"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 9000,							
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 9000,							
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,							
FITTING	3"	18"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	3"	18"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 9000,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 9000,							
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 9000,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A106 GR.B,ASME B36.10M,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,							

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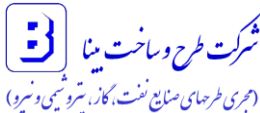

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	53 of 216

Piping Class:		B1A4								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		150#		RF		Trim Material:			Trim No.:CN 8	
Corrosion Allowance:		6mm				PWHT:			No	
Service:		DMDS								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 9000,							
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XXS,							
FITTING	3"	3"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,							
FITTING	4"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	8"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 60,							
FITTING	10"	10"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	12"	12"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	14"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	18"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 9000,							
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XXS,							
FITTING	3"	3"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 160,							
FITTING	4"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	8"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 60,							
FITTING	10"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	12"	12"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 40,							
FITTING	14"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	18"	18"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,							
FLANGE										
FLANGE	1/2"	18"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.5,							
FLANGE	1/2"	18"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	18"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	18"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
BLIND										
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	12"	18"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	1/2"	14"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	16"	18"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							





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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	54 of 216

Piping Class:		B1A4								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		150#		RF		Trim Material:			Trim No.:CN 8	
Corrosion Allowance:		6mm				PWHT:			No	
Service:		DMDS								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
GASKET										
GASKET	1/2"	18"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
GASKET	1/2"	18"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
BOLT & NUT										
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,							
VALVE										
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105 with corrosion allowance 6mm,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,							
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,							
VALVE	6"	18"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO,							
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105 with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,MFR							
VALVE	2"	18"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105 with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105 with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,							
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,							
VALVE	14"	18"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,							
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105 with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,							
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,							
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,							





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	PROPANE DEHYDROGENATION (PDH) PROJECT							
MC :  APG	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	55 of 216

Piping Class:		B1A4								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		150#		RF		Trim Material:			Trim No.:CN 8	
Corrosion Allowance:		6mm				PWHT:			No	
Service:		DMDS								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW,ASTM A105 with corrosion allowance 6mm,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,SW ASME B16.11,HO,							
VALVE	2"	14"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF,ASTM A216 WCB with corrosion allowance 6mm,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 599,FLANGED ASME B16.5.HO.							

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، پیمانکاری و اجرا)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	56 of 216



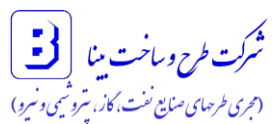

Piping Class:	B2A1								
Design Code:	ASME B31.3				Base Material:			Killed Carbon Steel	
Flange Rating & Facing:	300#				Trim Material:			Trim No.:8	
Corrosion Allowance:	1.5 mm				PWHT:			No	
Service:	N2, Product Gas, Propane, Propylene, H2, Ethane, Methane, Hydrocarbon, C3, C4, Desiccant, Isobutane, Propane,Isobutylene, Isobutane, Butane, Propylene,Methanol, Heavy Aromatics, Washing Oil(Buried), Solvent								
Design Temperature(C):	−29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):	51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
PIPE									
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,						
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,						
PIPE	2 1/2"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,						
PIPE	12"	12"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,						
PIPE	14"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,						
PIPE	18"	20"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 30,						
PIPE	22"	22"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 14.27 mm,						
PIPE	24"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,SCH 30,						
PIPE	26"	26"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 15.88 mm,						
PIPE	28"	28"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,SCH 30,						
PIPE	30"	30"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 17.48 mm,						
PIPE	32"	32"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M, SCH 40,						
PIPE	34"	36"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 20.62 mm,						
PIPE	38"	44"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 23.83 mm,						
PIPE	46"	48"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 26.97 mm,						
FITTING									
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,						
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,						
FITTING	2 1/2"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	12"	12"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,						
FITTING	14"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,						
FITTING	18"	20"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,						
FITTING	22"	22"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 14.27 mm,						
FITTING	24"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 30,						
FITTING	26"	26"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, THK. 15.88 mm,						
FITTING	28"	28"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH 30,						
FITTING	30"	30"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 17.48 mm,						
FITTING	32"	32"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH 40.						

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	57 of 216





Piping Class:		B2A1								
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		300#				Trim Material:		Trim No.:8		
Corrosion Allowance:		1.5 mm				PWHT:		No		
Service:		N2, Product Gas, Propane, Propylene, H2, Ethane, Methane, Hydrocarbon, C3, C4, Desiccant, Isobutane, Propane,Isobutylene, Isobutane, Butane, Propylene,Methanol, Heavy Aromatics, Washing Oil(Buried), Solvent								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FITTING	34"	36"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,							
FITTING	38"	44"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 23.83 mm,							
FITTING	46"	48"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 26.97 mm,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,							
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	2 1/2"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	12"	12"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	14"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	20"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	22"	22"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 30,							
FITTING	26"	26"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 15.88 mm,							
FITTING	28"	28"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 30,							
FITTING	30"	30"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, THK. 17.48 mm,							
FITTING	32"	32"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 40,							
FITTING	34"	36"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,							
FITTING	38"	44"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 23.83 mm,							
FITTING	46"	48"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 26.97 mm,							
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,							
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	2 1/2"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	12"	12"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	14"	16"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	20"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	22"	22"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,							
FITTING	26"	26"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 15.88 mm,							

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	58 of 216





Piping Class:		B2A1								
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		300#				Trim Material:		Trim No.:8		
Corrosion Allowance:		1.5 mm				PWHT:		No		
Service:		N2, Product Gas, Propane, Propylene, H2, Ethane, Methane, Hydrocarbon, C3, C4, Desiccant, Isobutane, Propane,Isobutylene, Isobutane, Butane, Propylene,Methanol, Heavy Aromatics, Washing Oil(Buried), Solvent								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FITTING	28"	28"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,							
FITTING	30"	30"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 17.48 mm,							
FITTING	32"	32"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	34"	36"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 20.62 mm,							
FITTING	38"	44"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 23.83mm,							
FITTING	46"	48"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 26.97 mm,							
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,							
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,							
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,							
FITTING	3"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	26"	48"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,							
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	26"	48"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,							
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	2 1/2"	10"	Tee-Straight. SMLS,BW.ASTM A234 WPB.ASME B16.9.SCH STD.							

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	59 of 216



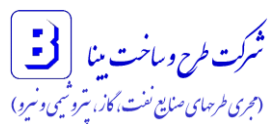

Piping Class:		B2A1								
Design Code:		ASME B31.3				Base Material:			Killed Carbon Steel	
Flange Rating & Facing:		300#				Trim Material:			Trim No.:8	
Corrosion Allowance:		1.5 mm				PWHT:			No	
Service:		N2, Product Gas, Propane, Propylene, H2, Ethane, Methane, Hydrocarbon, C3、C4, Desiccant、Isobutane, Propane,Isobutylene, Isobutane, Butane, Propylene,Methanol, Heavy Aromatics, Washing Oil(Buried), Solvent								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FITTING	12"	12"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	14"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	20"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	22"	22"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 30,							
FITTING	26"	26"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 15.88 mm,							
FITTING	28"	28"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH 30,							
FITTING	30"	30"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 17.48 mm,							
FITTING	32"	32"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH 40,							
FITTING	34"	36"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,							
FITTING	38"	44"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 23.83 mm,							
FITTING	46"	48"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 26.97 mm,							
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,							
FITTING	2 1/2"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	12"	12"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	14"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	18"	20"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 30,							
FITTING	22"	22"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, THK. 14.27 mm,							
FITTING	24"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH 30,							
FITTING	26"	26"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, THK. 15.88 mm,							
FITTING	28"	28"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH 30,							
FITTING	30"	30"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 17.48 mm,							
FITTING	32"	32"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9, SCH 40,							
FITTING	34"	36"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,							
FITTING	38"	44"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 23.83 mm,							
FITTING	46"	48"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 26.97 mm,							
FLANGE										
FLANGE	1/2"	24"	Flange, Blind,CL 300,RF,ASTM A105,ASME B16.5,							
FLANGE	26"	48"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,							
FLANGE	1/2"	24"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.5,							

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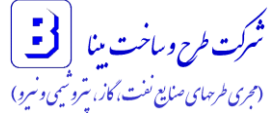

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	60 of 216

Piping Class:		B2A1								
Design Code:		ASME B31.3				Base Material:			Killed Carbon Steel	
Flange Rating & Facing:		300#				Trim Material:			Trim No.:8	
Corrosion Allowance:		1.5 mm				PWHT:			No	
Service:		N2, Product Gas, Propane, Propylene, H2, Ethane, Methane, Hydrocarbon, C3, C4, Desiccant, Isobutane, Propane,Isobutylene, Isobutane, Butane, Propylene,Methanol, Heavy Aromatics, Washing Oil(Buried), Solvent								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FLANGE	26"	48"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.47 Serial B,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	48"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	48"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
BLIND										
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	26"	48"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,/3981-00-BA-PI-DSH-056							
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	14"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	26"	48"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,							
GASKET										
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
GASKET	26"	48"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,							
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
GASKET	26"	48"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,							
BOLT & NUT										
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,							
VALVE										
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 300,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,							
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 300,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,							
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 300,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5 GO,							

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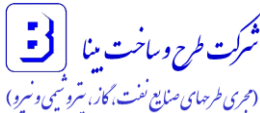

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	61 of 216

Piping Class:		B2A1								
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel		
Flange Rating & Facing:		300#				Trim Material:		Trim No.:8		
Corrosion Allowance:		1.5 mm				PWHT:		No		
Service:		N2, Product Gas, Propane, Propylene, H2, Ethane, Methane, Hydrocarbon, C3, C4, Desiccant, Isobutane, Propane,Isobutylene, Isobutane, Butane, Propylene,Methanol, Heavy Aromatics, Washing Oil(Buried), Solvent								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,							
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,							
VALVE	2"	24"	CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.5,Self Operated,							
VALVE	26"	48"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602, SW/FNPT, ASME B16.11,HO,							
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,							
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,							
VALVE	26"	36"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,MFR							
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,							
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,							
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,MFR							
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 300,WAFER / LUG,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,WAFER/LUG NON FLANGED,HO,							
VALVE	6"	24"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 300,WAFER / LUG,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,WAFER/LUG NON FLANGED,GO,							
VALVE	26"	48"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 300,WAFER / LUG,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,WAFER/LUG NON FLANGED,GO,							

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	62 of 216



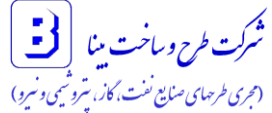

Piping Class:		B2A2								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		300#	RF	Trim Material:			Trim No.8			
Corrosion Allowance:		3mm			PWHT:			No		
Service:		Propylene、Propane、Isobutane、H2、Hydrocarbon								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
PIPE										
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH 160,							
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,							
PIPE	2 1/2"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,							
PIPE	12"	14"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,							
PIPE	16"	18"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH XS,							
PIPE	20"	22"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,THK. 14.27 mm,							
PIPE	24"	24"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,THK. 15.88 mm,							
PIPE	26"	30"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 17.48 mm,							
FITTING										
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	2 1/2"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	12"	14"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 40,							
FITTING	16"	18"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	20"	22"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 15.88 mm,							
FITTING	26"	30"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 17.48 mm,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	2 1/2"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	12"	14"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 40,							
FITTING	16"	18"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	20"	22"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 15.88 mm,							
FITTING	26"	30"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 17.48 mm,							
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	63 of 216



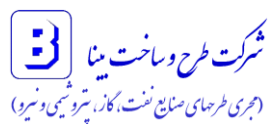

Piping Class:		B2A2								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		300#		RF		Trim Material:			Trim No.8	
Corrosion Allowance:		3mm			PWHT:			No		
Service:		Propylene, Propane, Isobutane, H2, Hydrocarbon								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FITTING	2 1/2"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	12"	14"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 40,							
FITTING	16"	18"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	20"	22"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 15.88 mm,							
FITTING	26"	30"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 17.48 mm,							
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 6000,							
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 6000,							
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,							
FITTING	2 1/2"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	26"	30"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,							
FITTING	2 1/2"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	26"	30"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,							
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 6000,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,							
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	2 1/2"	10"	Tee-Straight. SMLS.BW.ASTM A234 WPB.ASME B16.9.SCH STD.							

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
	MC : 	Piping Material Specification						
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 64 of 216



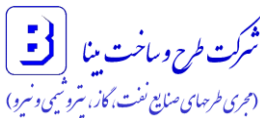

Piping Class:		B2A2								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		300#		RF	Trim Material:			Trim No.8		
Corrosion Allowance:		3mm			PWHT:			No		
Service:		Propylene、Propane、Isobutane, H2、Hydrocarbon								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FITTING	12"	14"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	16"	18"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	20"	22"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 15.88 mm,							
FITTING	26"	30"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 17.48 mm,							
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 6000,							
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,							
FITTING	2 1/2"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	12"	14"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	16"	18"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	20"	22"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 14.27 mm,							
FITTING	24"	24"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 15.88 mm,							
FITTING	26"	30"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 17.48 mm,							
FLANGE										
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,							
FLANGE	26"	30"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,							
FLANGE	1/2"	24"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.5,							
FLANGE	26"	30"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.47 Serial B ,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	30"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	30"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
BLIND										
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	26"	30"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,							
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	10"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,							

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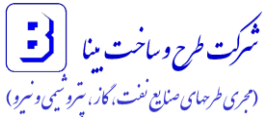
OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی و طراحی)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	65 of 216

Piping Class:			B2A2								
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#	RF	Trim Material:			Trim No.8			
Corrosion Allowance:			3mm			PWHT:		No			
Service:			Propylene, Propane, Isobutane, H2, Hydrocarbon								
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
BLINDS	26"	30"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,								
GASKET											
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								
GASKET	26"	30"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,								
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								
GASKET	26"	30"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,								
BOLT & NUT											
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,								
VALVE											
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 300,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,								
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 300,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,								
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,								
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,								
VALVE	26"	30"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,								
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,								
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,								
VALVE	26"	30"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,								
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,								

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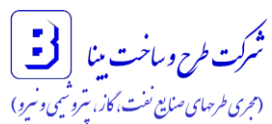

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 	
MC : 	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	66 of 216

Piping Class:		B2A2									
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel			
Flange Rating & Facing:		300#		RF		Trim Material:			Trim No.8		
Corrosion Allowance:		3mm			PWHT:			No			
Service:		Propylene, Propane, Isobutane, H2, Hydrocarbon									
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350	
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6	
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,								
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO.								

OWNER:  MC : 	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	67 of 216



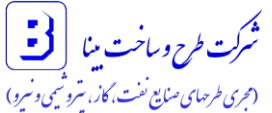

Piping Class:			B2A2N								
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#	RF	Trim Material:			Trim No.12			
Corrosion Allowance:			3mm			PWHT:		Yes			
Service:			Propane、H2S、Water								
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
PIPE											
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH 160,								
PIPE	2"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH XS,								
FITTING											
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,								
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	2"	8"	Elbow-90 LR,Wrought SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,								
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	2"	8"	Cap,Wrought SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,								
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,								
FITTING	3"	8"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,								
FITTING	3"	8"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,								
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,								
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000.								

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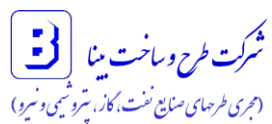

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	68 of 216

Piping Class:			B2A2N								
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#	RF		Trim Material:		Trim No.12			
Corrosion Allowance:			3mm			PWHT:		Yes			
Service:			Propane、H2S、Water								
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,								
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	2"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,								
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,								
FITTING	2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,								
FLANGE											
FLANGE	1/2"	8"	Flange,Blind,CL 300,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,								
FLANGE	1/2"	8"	Flange,Blind,CL 600,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,								
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,								
FLANGE	2"	8"	Flange WN,CL 300,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,								
FLANGE	1/2"	1 1/2"	Flange SW,CL 600,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,								
FLANGE	2"	8"	Flange WN,CL 600,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,								
BLIND											
BLINDS	1/2"	8"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,WET H2S SERVICE NACE MR0103,								
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,WET H2S SERVICE NACE MR0103,								
GASKET											
GASKET	1/2"	8"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								
GASKET	1/2"	8"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								
BOLT & NUT											
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,								
VALVE											
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW ASME B16.11,Self Operated,WET H2S SERVICE NACE MR0103,								
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,BS 1868,FLANGED ASME B16.5,Self Operated,WET H2S SERVICE NACE MR0103,								
VALVE	2"	8"	CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 594, ASME B16.5,Self Operated, WET H2S SERVICE NACE MR0103,								

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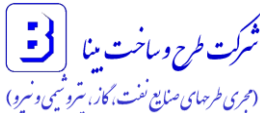

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	69 of 216

Piping Class:			B2A2N								
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#	RF	Trim Material:			Trim No.12			
Corrosion Allowance:			3mm			PWHT:		Yes			
Service:			Propane, H2S, Water								
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW ASME B16.11,HO,WET H2S SERVICE NACE MR0103,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW/FNPT, ASME B16.11,HO,WET H2S SERVICE NACE MR0103,								
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 600,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,								
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW ASME B16.11,HO,WET H2S SERVICE NACE MR0103,								
VALVE	2"	8"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,BS 1873,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,								

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	70 of 216



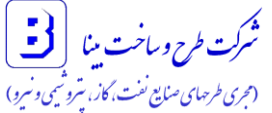

Piping Class:		B2A2Q								
Design Code:		ASME B31.3			Base Material:			Killed Carbon Steel		
Flange Rating & Facing:		300#	RF	Trim Material:			Trim. No.: CN 10			
Corrosion Allowance:		3mm			PWHT:			Yes		
Service:		10%NaOH、 30%NaOH 、 50%NaOH , wash water								
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):		51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
PIPE										
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M, SCH 160,							
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH XS,							
PIPE	3"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH STD,							
PIPE	8"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH 30,							
FITTING										
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11, Class 6000,							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,							
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	3"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	8"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11, Class 6000,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,							
FITTING	2"	2"	Elbow-90 LR,Wrought SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	3"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	8"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,							
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11, Class 6000,							
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,							
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,							
FITTING	3"	6"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,							
FITTING	8"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,							
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97, Class 6000,							
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97, Class 6000,							
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,							
FITTING	3"	10"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	3"	10"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc.. SMLS,Bevel Large End . MNPT Small End(BLE/TSE).ASTM A234 WPB.MSS SP-95.							

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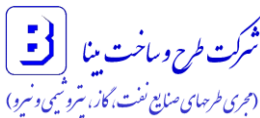

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	71 of 216

Piping Class:			B2A2Q								
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#		RF	Trim Material:		Trim. No.: CN 10			
Corrosion Allowance:			3mm			PWHT:		Yes			
Service:			10%NaOH、 30%NaOH 、 50%NaOH , wash water								
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,								
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,								
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,								
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,								
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11, Class 6000,								
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11, Class 6000,								
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83, Class 6000,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M, Same as pipe,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M, Same as pipe,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M, Same as pipe,								
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11, Class 6000,								
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,								
FITTING	3"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,								
FITTING	8"	10"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,								
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11, Class 6000,								
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,								
FITTING	3"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,								
FITTING	8"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 30,								
FLANGE											
FLANGE	1/2"	10"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,								
FLANGE	1/2"	10"	Flange, Blind,CL 600,RF,ASTM A105,ASME B16.5,								
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5, Same as pipe,								
FLANGE	2"	10"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5, Same as pipe,								
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5, Same as pipe,								
FLANGE	2"	10"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5, Same as pipe,								
BLIND											
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,								
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,								
GASKET											
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm.								

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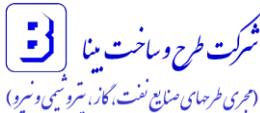

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	72 of 216

Piping Class:			B2A2Q								
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#	RF	Trim Material:			Trim. No.: CN 10			
Corrosion Allowance:			3mm			PWHT:		Yes			
Service:			10%NaOH、 30%NaOH 、 50%NaOH , wash water								
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6
GASKET	1/2"	10"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								
BOLT & NUT											
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,								
VALVE											
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 300,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,PWHT,								
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 300,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,PWHT,								
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,PWHT,								
VALVE	2"	10"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,PWHT,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,PWHT,								
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,PWHT,								
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,PWHT,								
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,PWHT,								
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN10 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,PWHT,								

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	73 of 216



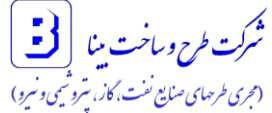

Piping Class:		B4A1						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN8	
Corrosion Allowance:		1.5mm			PWHT:		No	
Service:		Propylene、Propane、H2、C4、Hydrocarbon						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
PIPE								
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,					
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,					
PIPE	3"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,					
PIPE	12"	14"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,					
PIPE	16"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,					
FITTING								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	3"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,					
FITTING	12"	14"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,					
FITTING	16"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	3"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	12"	14"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,					
FITTING	16"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	3"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH STD,					
FITTING	12"	14"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,					
FITTING	16"	16"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,					
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,					
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,					
FITTING	3"	16"	Reducer-Conc. Reducer. SMLS,BW,ASTM A234 WPB,ASME B16.9,					

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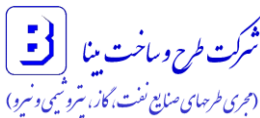

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	74 of 216

Piping Class:		B4A1						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN8	
Corrosion Allowance:		1.5mm			PWHT:		No	
Service:		Propylene, Propane, H2、 C4、 Hydrocarbon						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
FITTING	3"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	3"	10"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	12"	14"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,					
FITTING	16"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,					
FITTING	3"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	12"	14"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,					
FITTING	16"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FLANGE								
FLANGE	1/2"	16"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.5,					
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,					
FLANGE	2"	16"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,					
BLIND								

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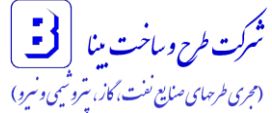

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی و ساخت صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	75 of 216

Piping Class:		B4A1						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN8	
Corrosion Allowance:		1.5mm			PWHT:		No	
Service:		Propylene, Propane, H2, C4, Hydrocarbon						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,					
BLINDS	10"	16"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,					
GASKET								
GASKET	1/2"	16"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,					
BOLT & NUT								
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,					
VALVE								
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,					
VALVE	2"	6"	CHECK VALVE DUAL PLATE,CL 600,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594,ASME B16.5,Self Operated,					
VALVE	2"	20"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,MFR					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/NPT,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/NPT, ASME B16.11,HO,MFR					
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,					
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,					
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,					
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,					
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	76 of 216



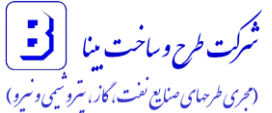

Piping Class:		B4A2						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN8	
Corrosion Allowance:		3mm			PWHT:		No	
Service:		N2						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
PIPE								
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH 160,					
PIPE	2"	2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH 160,					
PIPE	3"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,					
FITTING								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,					
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,					
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,					
FITTING	3"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,					
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,					
FITTING	3"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 6000,					
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,					
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,					
FITTING	3"	8"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 6000,					
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 6000,					
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,					
FITTING	3"	8"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,					
FITTING	3"	8"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End . MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,					

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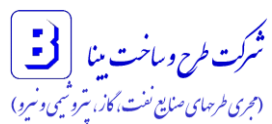

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	77 of 216

Piping Class:		B4A2						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN8	
Corrosion Allowance:		3mm			PWHT:		No	
Service:		N2						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 6000,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,					
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 6000,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,					
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 6000,					
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,					
FITTING	3"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 6000,					
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,					
FITTING	3"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FLANGE								
FLANGE	1/2"	8"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.5,					
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,					
FLANGE	2"	8"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,					
BLIND								
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,					
GASKET								
GASKET	1/2"	8"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,					
BOLT & NUT								
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,					
VALVE								
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,					
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,					

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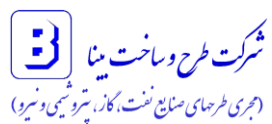

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
MC :  APG	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	78 of 216

Piping Class:		B4A2						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN8	
Corrosion Allowance:		3mm			PWHT:		No	
Service:		N2						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT,ASME B16.11,HO,					
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,					
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,					
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	79 of 216



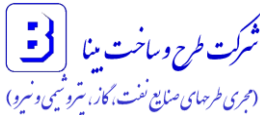

Piping Class:		B4A2N						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN12	
Corrosion Allowance:		3 mm			PWHT:		Yes	
Service:		Propane, H2S, Water						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
PIPE								
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH 160,					
PIPE	2"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	8"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,					
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105N,MSS SP-97,WET H2S SERVICE NACE MR0103,					
FITTING	3"	8"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,					
FITTING	3"	8"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,WET H2S SERVICE NACE MR0103,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000.					

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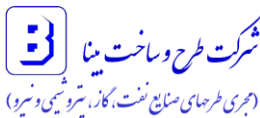

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	80 of 216

Piping Class:			B4A2N													
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel								
Flange Rating & Facing:			600#		RF		Trim Material:		CN12							
Corrosion Allowance:			3 mm			PWHT:		Yes								
Service:			Propane, H2S, Water													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			102.1		100.2		93.2		90.2		87.6		83.9		79.6	
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105N,MSS SP-83,WET H2S SERVICE NACE MR0103,Class 6000,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,WET H2S SERVICE NACE MR0103,Same as pipe,													
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,													
FITTING	2"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,													
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105N,ASME B16.11,WET H2S SERVICE NACE MR0103,Class 6000,													
FITTING	2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,WET H2S SERVICE NACE MR0103,SCH XS,													
FLANGE																
FLANGE	1/2"	8"	Flange,Blind,CL 600,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,													
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,													
FLANGE	2"	8"	Flange,WN,CL 600,RF,ASTM A105N,ASME B16.5,WET H2S SERVICE NACE MR0103,Same as pipe,													
BLIND																
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,WET H2S SERVICE NACE MR0103,													
GASKET																
GASKET	1/2"	8"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,													
BOLT & NUT																
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7M,NUT:ASTM A194 GR.2HM,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,													
VALVE																
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW ASME B16.11,Self Operated,WET H2S SERVICE NACE MR0103,													
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,BS 1868,FLANGED ASME B16.5,Self Operated,WET H2S SERVICE NACE MR0103,													
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW ASME B16.11,HO,WET H2S SERVICE NACE MR0103,													
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW/FNPT, ASME B16.11,HO,WET H2S SERVICE NACE MR0103,													
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 600,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,													

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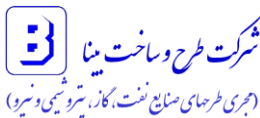

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
MC :  APG	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	81 of 216

Piping Class:		B4A2N						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF		Trim Material:		CN12	
Corrosion Allowance:		3 mm			PWHT:		Yes	
Service:		Propane, H2S, Water						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	83.9	79.6
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105N,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,API 602,SW ASME B16.11,HO,WET H2S SERVICE NACE MR0103,					
VALVE	2"	8"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7M / ASTM A194 Gr.2HM,BS 1873,FLANGED ASME B16.5,HO,WET H2S SERVICE NACE MR0103,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	82 of 216



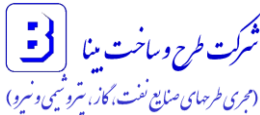

Piping Class:		B4A3					
Design Code:		ASME B31.3		Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF	Trim Material:		CN8	
Corrosion Allowance:		5mm		PWHT:		No	
Special Service:		H2					
Design Temperature(C):		-29 to 38		50	100	150	200
Design Pressure(Barg):		102.1		100.2	93.2	90.2	87.6
PIPE							
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,XXS,				
PIPE	2"	4"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 160,				
PIPE	6"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,12.7 mm,				
PIPE	8"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,14.27 mm,				
FITTING							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,				
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,				
FITTING	2"	4"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,				
FITTING	6"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,12.7 mm,				
FITTING	8"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,14.27 mm,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 6000,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,				
FITTING	2"	4"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,				
FITTING	6"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,12.7 mm,				
FITTING	8"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,14.27 mm,				
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 6000,				
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,				
FITTING	2"	4"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,				
FITTING	6"	6"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,12.7 mm,				
FITTING	8"	8"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,14.27 mm,				
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 6000,				
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 6000,				
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,				
FITTING	3"	8"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,				
FITTING	3"	8"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,				
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,				
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,				
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,				
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End . MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,				

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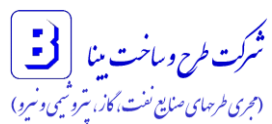

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 83 of 216

Piping Class:		B4A3					
Design Code:		ASME B31.3		Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF	Trim Material:		CN8	
Corrosion Allowance:		5mm		PWHT:		No	
Special Service:		H2					
Design Temperature(C):		-29 to 38		50	100	150	200
Design Pressure(Barg):		102.1		100.2	93.2	90.2	87.6
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,				
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,				
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,				
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,				
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 6000,				
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 6000,				
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 6000,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,				
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 6000,				
FITTING	2"	4"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,				
FITTING	6"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,12.7 mm,				
FITTING	8"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,14.27 mm,				
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 6000,				
FITTING	2"	4"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 160,				
FITTING	6"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,12.7 mm,				
FITTING	8"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,14.27 mm,				
FLANGE							
FLANGE	1/2"	8"	Blind,CL 600,RF,ASTM A105,ASME B16.5,				
FLANGE	1/2"	1 1/2"	SW,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,				
FLANGE	2"	8"	WN,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,				
BLIND							
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,				
GASKET							
GASKET	1/2"	8"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,				
BOLT & NUT							
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,				
VALVE							

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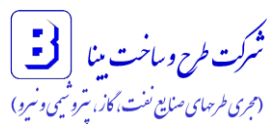

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طرحهای صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	84 of 216

Piping Class:			B4A3									
Design Code:			ASME B31.3		Base Material:		Killed Carbon Steel					
Flange Rating & Facing:			600#	RF		Trim Material:		CN8				
Corrosion Allowance:			5mm		PWHT:		No					
Special Service:			H2									
Design Temperature(C):			-29 to 38		50		100		150		200	
Design Pressure(Barg):			102.1		100.2		93.2		90.2		87.6	
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,									
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,MFR									
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,									
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,									
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,									
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,									
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO.									



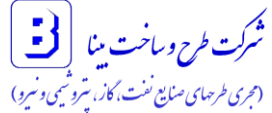

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	85 of 216

Piping Class:	C1D0			
Design Code:	ASME B31.3		Base Material:	CPVC
Flange Rating & Facing:	150#	FF	Trim Material:	CPVC
Corrosion Allowance:	0mm		PWHT:	No
Special Service:	Hypochlorite sodium			
Design Temperature(C):	-29 to 45			
Design Pressure(Barg):	16			
PIPE				
PIPE	1/2"	6"	PIPE WITH PE, SOLVENT CEMENTING, CPVC,SCH 80, PLASTIC PIPE AS PER ASTM F441/ASTM D1784,(SUITABLE FOR 16 BAR DESIGN PRESSURE)	
FITTING				
FITTING	1/2"	6"	45 DEG ELBOW WITH SOCKET END FOR SOLVENT CEMENTING, CPVC, SUITABLE FOR 16 BAR DESIGN PRESSURE, ASTM D1784/ASTM F439, (SUITABLE FOR 16 BAR DESIGN PRESSURE), SCH 80	
FITTING	1/2"	6"	90 DEG ELBOW WITH SOCKET END FOR SOLVENT CEMENTING, CPVC, SUITABLE FOR 16 BAR DESIGN PRESSURE, ASTM D1784/ASTM F439, (SUITABLE FOR 16 BAR DESIGN PRESSURE), SCH 80	
FITTING	1/2"	6"	CAP, WITH SOCKET END FOR SOLVENT CEMENTING, CPVC , SUITABLE FOR 16 BAR DESIGN PRESSURE, ASTM D1784/ASTM F439, (SUITABLE FOR 16 BAR DESIGN PRESSURE), SCH 80	
FITTING	1/2"	6"	CONCENTRIC REDUCER, MALE/FEMALE SOCKET ENDS, SOLVENT CEMENTING, CPVC, SUITABLE FOR PIPE RATED 16 BAR DESIGNPRESSURE, ASTM D1784/ASTM F439, SCH 80	
FITTING	1/2"	6"	ECCENTRIC REDUCER, MALE/FEMALE SOCKET ENDS, CPVC, SOLVENT CEMENTING, SUITABLE FOR PIPE RATED 16 BAR DESIGN PRESSURE, ASTM D1784/ASTM F439, SCH 80	
FITTING	1/2"	6"	REDUCING TEE WITH SOCKET END FOR SOLVENT CEMENTING, CPVC, SUITABLE FOR 16 BAR DESIGN PRESSURE, ASTM D1784/ASTM F439, SCH 80	
FITTING	1/2"	6"	EQUAL TEE WITH SOCKET END FOR SOLVENT CEMENTING, CPVC, SUITABLE FOR 16 BAR DESIGN PRESSURE, ASTM D1784/ASTM F439, SCH 80	
FITTING	1/2"	6"	COUPLING WITH SOCKET END FOR SOLVENT CEMENTING, CPVC, SUITABLE FOR 16 BAR DESIGN PRESSURE, ASTM D1784/ASTM F439, SCH 80	
FLANGE				
FLANGE	1/2"	6"	FLANGE, SOCKET END FOR SOLVENT CEMENTING,CPVC, SCH 80, ASTM D1784, SUITABLE FOR 16 BAR DESIGN PRESSURE, ASME B16.5. CL 150, FF	
FLANGE	1/2"	6"	FLANGE, SOCKET END FOR SOLVENT CEMENTING,CPVC, SCH 80, ASTM D1784, SUITABLE FOR 16 BAR DESIGN PRESSURE, ASME B16.5. CL 300, FF	
BLINDS	1/2"	1/2"	FLG BLIND FF CL 150, CPVC, ASTM D1784, ASME B16.5, SUITABLE FOR 16 BAR DESIGN PRESSURE	
BLINDS	1/2"	1/2"	FLG BLIND FF CL 300, CPVC, ASTM D1784,ASME B16.5, SUITABLE FOR 16 BAR DESIGN PRESSURE	
BLIND				
BLINDS	1/2"	6"	SPECTACLE BLIND FF CL 150, CPVC, ASTM D1784, SUITABLE FOR 16 BAR DESIGN PRESSURE,ASME B16.48	
BLINDS	1/2"	6"	SPECTACLE BLIND FF CL 300, CPVC, ASTM D1784,SUITABLE FOR 16 BAR DESIGN PRESSURE, ASME B16.48	
GASKET				
GASKET	1/2"	6"	NEOPRENE, FULL FACE, 3 MM THK, CL150, SHORE HARDNESS (60 TO 70 MAXIMUM), TO SUIT ASME B16.5 FLANGES,ASME B16.21,	
GASKET	1/2"	6"	NEOPRENE, FULL FACE, 3 MM THK, CL300, SHORE HARDNESS (60 TO 70 MAXIMUM), TO SUIT ASME B16.5 FLANGES,ASME B16.21,	
BOLT & NUT				
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,	
VALVE				
VALVE	1/2"	2"	GATE VALVE , BODY/DISC/SEAT:CPVC, FLANGED ENDS,FF,CL150, FOR DES. PRESS. OF 16 BAR., ASME B 16.5. ISO 16139 HO	

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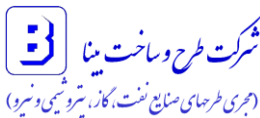

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
MC :  APG	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	86 of 216

Piping Class:		C1D0					
Design Code:		ASME B31.3		Base Material:		CPVC	
Flange Rating & Facing:		150#	FF		Trim Material:		CPVC
Corrosion Allowance:		0mm			PWHT:		No
Special Service:		Hypochlorite sodium					
Design Temperature(C):		-29 to 45					
Design Pressure(Barg):		16					
VALVE	2 1/2"	6"	GATE VALVE , BODY/DISC/SEAT:CPVC, FLEXIBLE WEDGE,FLANGED ENDS,FF,CL150,ASME B16.5, FOR DES. PRESS. OF 16 BAR. ISO 16139,HO				
VALVE	1/2"	6"	GLOBE VALVE, Body: CPVC, Disc: CPVC, Seat:C PVC, PLUG DISC TYPE, BB, OS&Y FLANGED ENDS,FF,CL150,ASME B16.5, ISO 21787, HO				
VALVE	1/2"	6"	BALL VALVE, BODY:CPVC, SEAT:PTFE, STEM&BALL:CPVC, FB, FLANGED ENDS,FF,CL150,ASME B16.5, FOR DES. PRESS. OF 16 BAR ,ISO 16135,				
VALVE	1/2"	1 1/2"	CHECK VALVE, Body: CPVC, Disc: CPVC, Seat: CPVC, Lift Type, Piston Type, BC,FLANGED END, FF, CL150, ASME B16.5, FOR DES. PRESS. OF 16 BAR , ISO 16137, SELF OPERATED				
VALVE	2"	6"	CHECK VALVE, Body: CPVC, Disc: CPVC, Seat: CPVC, DUAL PLATE Type, RETAINERLESS,WAFER TYPE, FF, CL150, ASME B16.5, FOR DES. PRESS. OF 16 BAR . ISO 16137, SELF OPERATED				

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	87 of 216



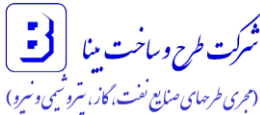

Piping Class:			E2A1											
Design Code:			ASME B31.3					Base Material:			Alloy Steel (11/4Cr 1/2 Mo)			
Flange Rating & Facing:			300#		RF		Trim Material:			CN 5				
Corrosion Allowance:			1.5mm					PWHT:			Yes			
Service:			Regeneration Gas, Air, Cl											
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2
PIPE														
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A335 P11,ASME B36.10M ,SCH XS,											
PIPE	2"	8"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M ,SCH XS,											
FITTING														
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F11 CL2,ASME B16.11 ,Class 3000,											
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9, SCH XS,											
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	2"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9, SCH XS,											
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,											
FITTING	2"	8"	Cap, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9, SCH XS,											
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F11 CL2,MSS SP-97, Class 3000,											
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 F11 CL2,MSS SP-97, Class 3000,											
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F11 CL2,MSS SP-97,											
FITTING	3"	8"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,											
FITTING	3"	8"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,											
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 CL2,MSS SP-95,											
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F11 CL2,MSS SP-83, Class 3000,											

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	88 of 216

Piping Class:			E2A1											
Design Code:			ASME B31.3				Base Material:			Alloy Steel (11/4Cr 1/2 Mo)				
Flange Rating & Facing:			300#		RF		Trim Material:			CN 5				
Corrosion Allowance:			1.5mm				PWHT:			Yes				
Service:			Regeneration Gas、 Air、 Cl											
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A335 P11,ASME B36.10M, Same as pipe,											
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A335 P11,ASME B36.10M, Same as pipe,											
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,,POE/TOE,ASTM A335 P11,ASME B36.10M, Same as pipe,											
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	2"	8"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9, SCH XS,											
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F11 CL2,ASME B16.11, Class 3000,											
FITTING	2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9, SCH XS,											
FLANGE														
FLANGE	1/2"	8"	Flange,Blind,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,											
FLANGE	1/2"	8"	Flange,Blind,CL 600,RF,ASTM A182 F11 CL2,ASME B16.5,											
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,											
FLANGE	2"	8"	Flange,WN,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,											
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,											
FLANGE	2"	8"	Flange,WN,CL 600,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,											
BLIND														
BLINDS	1/2"	8"	Spectacle blind,CL 300,RF (RF),ASTM A387 GR.11 CL2,ASME B16.48,											
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A387 GR.11 CL2,ASME B16.48,											
GASKET														
GASKET	1/2"	8"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,											
GASKET	1/2"	8"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,											
BOLT & NUT														
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B16,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,CERAMIC COATED,											
VALVE														
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,Self Operated,PWHT,											
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT,											
VALVE	2"	2"	CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 594, ASME B16.5,Self Operated,											

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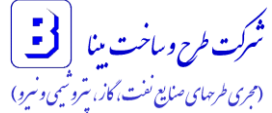

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	89 of 216

Piping Class:			E2A1											
Design Code:			ASME B31.3				Base Material:			Alloy Steel (11/4Cr 1/2 Mo)				
Flange Rating & Facing:			300#		RF		Trim Material:			CN 5				
Corrosion Allowance:			1.5mm				PWHT:			Yes				
Service:			Regeneration Gas、 Air、 Cl											
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT,											
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/FNPT ASME B16.11,HO,PWHT,											
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HO,PWHT,											
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT,											
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HO,PWHT,											

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسین مشاور)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	90 of 216



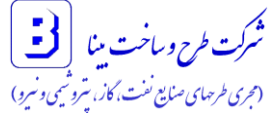

Piping Class:		M1A1									
Design Code:		ASME B31.3			Base Material:		S.S 316/316L				
Flange Rating & Facing:		150#		RF		Trim Material:		CN 12			
Corrosion Allowance:		1.5mm			PWHT:		No				
Service:		DMDS corrosive media, CHEMICALS									
Design Temperature(C):		-196 to 38		50		100		150		200	
Design Pressure(Barg):		19.0		18.3		15.7		14.2		13.2	
PIPE											
PIPE		1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 80S,							
PIPE		2"	2"	Pipe,SMLS,BE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 80S,							
PIPE		3"	8"	Pipe,SMLS,BE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 40S,							
PIPE		10"	10"	Pipe,SMLS,BE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 10S,							
PIPE		12"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.316/316L CL1,ASME B36.10M,LT System (Lateral Expansion at -196C),SCH 10,							
FITTING											
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,							
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,							
FITTING		2"	2"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,							
FITTING		3"	8"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,							
FITTING		10"	10"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,							
FITTING		12"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10,							
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,							
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,							
FITTING		2"	2"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,							
FITTING		3"	8"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,							
FITTING		10"	10"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,							
FITTING		12"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10,							
FITTING		1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,							
FITTING		1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,							
FITTING		1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,							
FITTING		2"	2"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,							
FITTING		3"	8"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,							
FITTING		10"	10"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,							
FITTING		12"	24"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10,							

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	Piping Material Specification						CONTRACTOR/CONSULTANT:  							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.								
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 91 of 216						



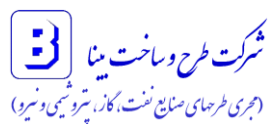

Piping Class:			M1A1									
Design Code:			ASME B31.3			Base Material:		S.S 316/316L				
Flange Rating & Facing:			150#		RF		Trim Material:		CN 12			
Corrosion Allowance:			1.5mm			PWHT:		No				
Service:			DMDS corrosive media, CHEMICALS									
Design Temperature(C):			-196 to 38		50		100		150		200	
Design Pressure(Barg):			19.0		18.3		15.7		14.2		13.2	
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F316/316L,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,									
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 F316/316L,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,									
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F316/316L,MSS SP-97,LT System (Lateral Expansion at -196C),									
FITTING	3"	6"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),									
FITTING	8"	24"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),									
FITTING	3"	6"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),									
FITTING	8"	24"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),									
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),									
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,									
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F316,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,									
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F316/316L,MSS SP-83,LT System (Lateral Expansion at -196C),Class 3000,									
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS, PBE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,									
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS, TBE(NPT-M),ASTM A312 TP316,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,									
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS, POE/TOE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,									
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,									
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,									
FITTING	3"	8"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,									
FITTING	10"	10"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,									

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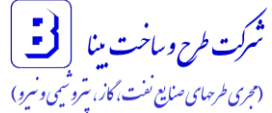

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	92 of 216

Piping Class:			M1A1									
Design Code:			ASME B31.3			Base Material:		S.S 316/316L				
Flange Rating & Facing:			150#		RF		Trim Material:		CN 12			
Corrosion Allowance:			1.5mm			PWHT:		No				
Service:			DMDS corrosive media, CHEMICALS									
Design Temperature(C):			-196 to 38		50		100		150		200	
Design Pressure(Barg):			19.0		18.3		15.7		14.2		13.2	
FITTING	12"	24"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10,									
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,									
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,									
FITTING	3"	8"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,									
FITTING	10"	10"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,									
FITTING	12"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10,									
FLANGE												
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),									
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),									
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,									
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,									
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe									
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,									
BLIND												
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),									
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),									
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),									
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),									
GASKET												
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,									
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,									
BOLT & NUT												
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,									
VALVE												
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,Self Operated,									

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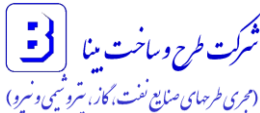

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی و ساخت صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	93 of 216

Piping Class:		M1A1						
Design Code:		ASME B31.3			Base Material:		S.S 316/316L	
Flange Rating & Facing:		150#	RF		Trim Material:		CN 12	
Corrosion Allowance:		1.5mm			PWHT:		No	
Service:		DMDS corrosive media, CHEMICALS						
Design Temperature(C):		-196 to 38	50	100		150		200
Design Pressure(Barg):		19.0	18.3	15.7		14.2		13.2
VALVE	2"	12"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,					
VALVE	14"	24"	CHECK VALVE DUAL PLATE,CL 150,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,					
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,					
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,GO,					
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,					
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,HO,					
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,GO,					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	94 of 216



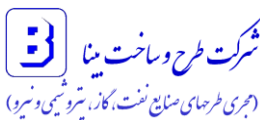

Piping Class:		M2A1									
Design Code:		ASME B31.3			Base Material:		SS 316/316L				
Flange Rating & Facing:		300#		RF		Trim Material:		CN 12			
Corrosion Allowance:		1.5mm			PWHT:		No				
Service:		C4									
Design Temperature(C):		−196 to 38		50		100		150		200	
Design Pressure(Barg):		49.6		48.1		42.2		38.5		35.7	
PIPE											
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 80S,								
PIPE	2"	6"	Pipe,SMLS,BE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 40S,								
PIPE	8"	12"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.316/316L CL1,ASME B36.10M,LT System (Lateral Expansion at -196C),SCH 30,								
PIPE	14"	16"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.316/316L CL1,ASME B36.10M,LT System (Lateral Expansion at -196C),SCH STD,								
PIPE	18"	18"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.316/316L CL1,ASME B36.10M,LT System (Lateral Expansion at -196C),SCH 30,								
PIPE	20"	20"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.316/316L CL1,ASME B36.10M,LT System (Lateral Expansion at -196C),SCH XS,								
FITTING											
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,								
FITTING	8"	12"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	14"	16"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,								
FITTING	18"	18"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	20"	20"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,								
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,								
FITTING	8"	12"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	14"	16"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,								
FITTING	18"	18"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	20"	20"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,								
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	2"	6"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,								

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	95 of 216



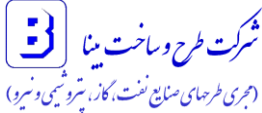

Piping Class:		M2A1							
Design Code:		ASME B31.3			Base Material:		SS 316/316L		
Flange Rating & Facing:		300#		RF		Trim Material:		CN 12	
Corrosion Allowance:		1.5mm			PWHT:		No		
Service:		C4							
Design Temperature(C):		-196 to 38		50		100		150	200
Design Pressure(Barg):		49.6		48.1		42.2		38.5	35.7
FITTING	8"	12"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,						
FITTING	14"	16"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,						
FITTING	18"	18"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,						
FITTING	20"	20"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,						
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F316/316L,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,						
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F316/316L,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,						
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F316/316L,MSS SP-97,LT System (Lateral Expansion at -196C),						
FITTING	3"	6"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),						
FITTING	8"	20"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),						
FITTING	3"	6"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),						
FITTING	8"	20"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),						
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP316/316L-S,MSS SP-95,LT System (Lateral Expansion at -196C),						
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,						
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F316,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,						
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F316/316L,MSS SP-83,LT System (Lateral Expansion at -196C),Class 3000,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A312 TP316,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A312 TP316/316L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,						

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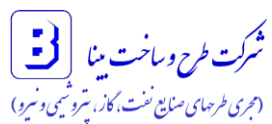

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 96 of 216

Piping Class:		M2A1									
Design Code:		ASME B31.3			Base Material:		SS 316/316L				
Flange Rating & Facing:		300#		RF		Trim Material:		CN 12			
Corrosion Allowance:		1.5mm			PWHT:		No				
Service:		C4									
Design Temperature(C):		-196 to 38		50		100		150		200	
Design Pressure(Barg):		49.6		48.1		42.2		38.5		35.7	
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,								
FITTING	8"	12"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	14"	16"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,								
FITTING	18"	18"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	20"	20"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,								
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F316/316L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,								
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,								
FITTING	8"	12"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	14"	16"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,								
FITTING	18"	18"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,								
FITTING	20"	20"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP316/316L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,								
FLANGE											
FLANGE	1/2"	20"	Flange,Blind,CL 300,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),								
FLANGE	1/2"	20"	Flange,Blind,CL 600,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),								
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,								
FLANGE	2"	20"	Flange,WN,CL 300,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,								
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,								
FLANGE	2"	20"	Flange,WN,CL 600,RF,ASTM A182 F316/316L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,								
BLIND											
BLINDS	1/2"	10"	Flange,Spectacle blind,CL 300,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),								
BLINDS	12"	20"	Flange,Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),								
BLINDS	1/2"	10"	Flange,Spectacle blind,CL 600,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),								
BLINDS	12"	20"	Flange,Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.316,ASME B16.48,LT System (Lateral Expansion at -196C),								
GASKET											
GASKET	1/2"	20"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								

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OWNER:  Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی و طراحی)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	97 of 216

Piping Class:		M2A1									
Design Code:		ASME B31.3			Base Material:		SS 316/316L				
Flange Rating & Facing:		300#		RF		Trim Material:		CN 12			
Corrosion Allowance:		1.5mm			PWHT:		No				
Service:		C4									
Design Temperature(C):		-196 to 38		50		100		150		200	
Design Pressure(Barg):		49.6		48.1		42.2		38.5		35.7	
GASKET	1/2"	20"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								
BOLT & NUT											
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,								
VALVE											
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,Self Operated,								
VALVE	2"	12"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,								
VALVE	14"	20"	CHECK VALVE DUAL PLATE,CL 300,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,								
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,								
VALVE	14"	20"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,GO,								
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F316/316L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,								
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,HO,								
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,GO,								



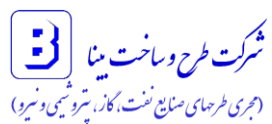

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	98 of 216

Piping Class:		M3A1									
Design Code:		ASME B31.3		Base Material:		S.S 316/316L					
Flange Rating & Facing:		600#		RF		Trim Material:		CN 12			
Corrosion Allowance:		1.5mm				PWHT:		No			
Service:		Phosphate solution (gas bag dosing line)									
Design Temperature(C):		-29 to 38		50		100		150		200	
Design Pressure(Barg):		99.3		96.2		84.4		77.0		71.3	
PIPE											
PIPE		1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP316/316L,ASME B36.19M,SCH 80S,							
PIPE		2"	2"	Pipe,SMLS,BE,ASTM A312 TP316/316L,ASME B36.19M,SCH 80S,							
FITTING											
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F316/316L,ASME B16.11,Class 3000,							
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F316/316L,ASME B16.11,Class 3000,							
FITTING		2"	2"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,							
FITTING		2"	2"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,							
FITTING		1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F316/316L,ASME B16.11,Class 3000,							
FITTING		1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F316/316L,MSS SP-97,Class 3000,							
FITTING		2"	2"	Cap, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9 ,SCH 80S,							
FITTING		3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316/316L-S,MSS SP-95,							
FITTING		3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316/316L-S,MSS SP-95,							
FITTING		2"	2"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,							
FITTING		2"	2"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP316/316L-S,MSS SP-95,							
FITTING		1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F316/316L,ASME B16.11,Class 3000,							
FITTING		1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F316/316L,MSS SP-83,Class 3000,							
FITTING		1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F316/316L,ASME B16.11,Class 3000,							
FITTING		1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F316/316L,ASME B16.11,Class 3000,							
FITTING		2"	2"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9, SCH 80S,							
FITTING		2"	2"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,							
FLANGE											
FLANGE		1/2"	2"	Flange,Blind,CL 600,RF,ASTM A182 F316/316L,ASME B16.5,							
FLANGE		1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F316/316L,ASME B16.5,Same as pipe,							
FLANGE		2"	2"	Flange,WN,CL 600,RF,ASTM A182 F316/316L,ASME B16.5,Same as pipe,							
BLIND											
BLINDS		1/2"	2"	Spectacle blind,CL 600,RF (RF),ASTM A240 GR.316,ASME B16.48,							
GASKET											
GASKET		1/2"	2"	SPWgasket,CL 600,For Use With RF Flange,316L METALLIC+FLEXIBLE GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
BOLT & NUT											

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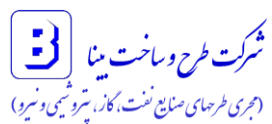

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی و ساخت صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	99 of 216

Piping Class:		M3A1									
Design Code:		ASME B31.3		Base Material:		S.S 316/316L					
Flange Rating & Facing:		600#		RF		Trim Material:		CN 12			
Corrosion Allowance:		1.5mm				PWHT:		No			
Service:		Phosphate solution (gas bag dosing line)									
Design Temperature(C):		-29 to 38		50		100		150		200	
Design Pressure(Barg):		99.3		96.2		84.4		77.0		71.3	
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,								
VALVE											
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F316,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,Self Operated,								
VALVE	2"	2"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868, ASME B16.5,Self Operated,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F316,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,								
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F316,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,								
VALVE	2"	2"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,								
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F316,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,								
VALVE	2"	2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A351 CF8M,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873, ASME B16.5,HO,								

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	Piping Material Specification						CONTRACTOR/CONSULTANT:  	
	MC : 							
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 100 of 216



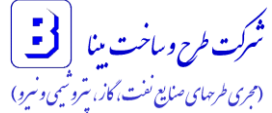

Piping Class:		N1A1				
Design Code:		ASME B31.3			Base Material:	SS 304/304L
Flange Rating & Facing:		150 #	RF		Trim Material:	CN12
Corrosion Allowance:		1.5mm			PWHT:	No
Service:		LPG/H2,FG(Fuel Gas)				
Design Temperature(C):		-29 to 38	50	100	150	180
Design Pressure(Barg):		19.0	18.3	15.7	14.2	13.6
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304/304L,ASME B36.19M,SCH 80S,			
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,SCH 80S,			
PIPE	2 1/2"	8"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,SCH 40S,			
PIPE	10"	10"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,SCH 10S,			
PIPE	12"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304/304L CL1,ASME B36.10M,SCH 10,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 80S,			
FITTING	2 1/2"	8"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	10"	10"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 10S,			
FITTING	12"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,SCH 10,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 80S,			
FITTING	2 1/2"	8"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	10"	10"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 10S,			
FITTING	12"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,SCH 10,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	2"	2"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 80S,			
FITTING	2 1/2"	8"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	10"	10"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 10S,			
FITTING	12"	24"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 10,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F304/304L,MSS SP-97,Class 3000,			
FITTING	1/2"	1 1/2"	Latrolet,Forged,SW,ASTM A182 F304/304L,MSS SP-97,Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 F304,MSS SP-97,Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F304/304L,MSS SP-97,			

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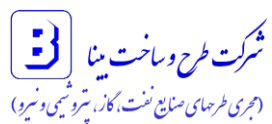

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification							CONTRACTOR/CONSULTANT:  	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 101 of 216

Piping Class:		N1A1									
Design Code:		ASME B31.3			Base Material:		SS 304/304L				
Flange Rating & Facing:		150 #		RF		Trim Material:		CN12			
Corrosion Allowance:		1.5mm			PWHT:		No				
Service:		LPG/H2,FG(Fuel Gas)									
Design Temperature(C):		-29 to 38		50		100		150		180	
Design Pressure(Barg):		19.0		18.3		15.7		14.2		13.6	
FITTING	3"	10"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,								
FITTING	12"	24"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,								
FITTING	3"	10"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,								
FITTING	12"	24"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,								
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc.,Wrought SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	2"	4"	Swage Nipple-Ecc.,Wrought SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc.,Wrought SMLS,PLE/TSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	2"	4"	Swage Nipple-Ecc.,Wrought SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,								
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,								
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,								
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F304/304L,MSS SP-83,Class 3000,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A312 TP304/304L,ASME B36.19M,Same as pipe,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A312 TP304,ASME B36.19M,Same as pipe,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:75mmSMLS,TBE(NPT-M),ASTM A312 TP304,ASME B36.19M,Same as pipe,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A312 TP304/304L,ASME B36.19M,Same as pipe,								
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,								
FITTING	2"	2"	Tee-Straight,Wrought SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 80S,								
FITTING	2 1/2"	8"	Tee-Straight,Wrought SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,								
FITTING	10"	10"	Tee-Straight,Wrought SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 10S,								
FITTING	12"	24"	Tee-Straight,Wrought Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,SCH 10,								
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,								
FITTING	2"	2"	Tee-Reducing,Wrought SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 80S,								
FITTING	2 1/2"	8"	Tee-Reducing,Wrought SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,								
FITTING	10"	10"	Tee-Reducing,Wrought SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 10S,								
FITTING	12"	24"	Tee-Reducing,Wrought Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,SCH 10,								





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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 102 of 216

Piping Class:		N1A1				
Design Code:		ASME B31.3		Base Material:	SS 304/304L	
Flange Rating & Facing:		150 #	RF	Trim Material:	CN12	
Corrosion Allowance:		1.5mm		PWHT:	No	
Service:		LPG/H2,FG(Fuel Gas)				
Design Temperature(C):		-29 to 38	50	100	150	180
Design Pressure(Barg):		19.0	18.3	15.7	14.2	13.6
FLANGE						
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A182 F304,ASME B16.5,			
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A182 F304,ASME B16.5,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,			
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,			
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
BLIND						
BLINDS	1/2"	14"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,			
BLINDS	16"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,			
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,			
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,			
GASKET						
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,Self Operated,			
VALVE	2"	12"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,			
VALVE	14"	24"	CHECK VALVE DUAL PLATE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,			



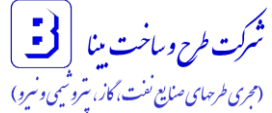

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	103 of 216

Piping Class:		N1A1									
Design Code:		ASME B31.3			Base Material:		SS 304/304L				
Flange Rating & Facing:		150 #		RF		Trim Material:		CN12			
Corrosion Allowance:		1.5mm			PWHT:		No				
Service:		LPG/H2,FG(Fuel Gas)									
Design Temperature(C):		-29 to 38		50		100		150		180	
Design Pressure(Barg):		19.0		18.3		15.7		14.2		13.6	
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,								
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,GO,								
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F304/304L, ,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO								
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,HO,								
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,GO,								
VALVE	½"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F304/304L,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton ,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS EN ISO 17292,FLANGED ASME B16.5,HO,								
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 608,FLANGED ASME B16.5,HO,								
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton ,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 6D,FLANGED ASME B16.5,GO,								

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، پیمانکاری، تشریح و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	104 of 216



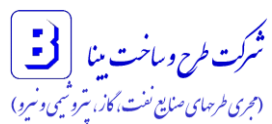

Piping Class:			PR-43-S			
Design Code:			ASME B31.3		Base Material:	316/316L
Flange Rating & Facing:			300#	RF	Trim Material:	316+STL
Corrosion Allowance:			1.5 mm		PWHT:	No
Service:			Cat			
Design Temperature(C):			-29 to 38	50	100	150
Design Pressure(Barg):			49.6	47.8	40.9	37.0
PIPE						
PIPE	1/2"	3"	Pipe,SMLS,BE,ASTM A312 TP316/316L,ASME B36.19M,SCH 80S,			
FITTING						
FITTING	1/2"	3"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,			
FITTING	1/2"	3"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,			
FITTING	1/2"	3"	Cap,Wrought SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,			
FITTING	1/2"	3"	Olet-Weldolet,Forged,BW,ASTM A182 F316/316L,MSS SP-97,			
FITTING	3"	3"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,			
FITTING	3"	3"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,			
FITTING	3/4"	3"	Swage Nipple-Conc., SMLS,BW,ASTM A403 GR.WP316/316L-S,MSS SP-95,			
FITTING	3/4"	3"	Swage Nipple-Ecc., SMLS,BW,ASTM A403 GR.WP316/316L-S,MSS SP-95,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,BW,ASTM A312 TP316/316L,ASME B36.19M,Same as pipe,			
FITTING	1/2"	3"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,			
FITTING	3/4"	3"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP316/316L-S,ASME B16.9,SCH 80S,			
FLANGE						
FLANGE	1/2"	3"	Flange,Blind,CL 300,RF,ASTM A182 F316,ASME B16.5,			
FLANGE	1/2"	3"	Flange,WN,CL 300,RF,ASTM A182 F316/316L,ASME B16.5,Same as pipe,			
BLIND						
BLINDS	1/2"	3"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.316,ASME B16.48,			
GASKET						
GASKET	1/2"	3"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 300,FLANGED, RF,ASTM A182 F316,STEM: 316, SEAT & BALL: 316 WITH STELLITE OVERLAY,SEAL:THERMICULITE 835,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS EN ISO 17292,FLANGED ASME B16.4,HO,			
VALVE	2"	3"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 300,FLANGED, RF,ASTM A351 CF8M,STEM: 316, SEAT & BALL: 316 WITH STELLITE OVERLAY,SEAL:THERMICULITE 835,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 608,FLANGED ASME B16.5,HO,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	105 of 216



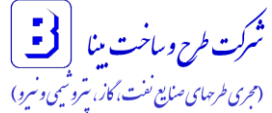

Piping Class:			R1A1			
Design Code:			ASME B31.3		Base Material:	Monel 400
Flange Rating & Facing:			150#	RF	Trim Material:	CN 11
Corrosion Allowance:			1.5		PWHT: No	
Service:			Corrosive Medium			
Design Temperature(C):			-29 to 38	50	100	
Design Pressure(Barg):			15.9	15.4	13.8	
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM B165 UNS N04400 ANNEALED(MONEL 400),ASME B36.10M,SCH XS,			
PIPE	2"	6"	Pipe,SMLS,BE,ASTM B165 UNS N04400 ANNEALED(MONEL 400),ASME B36.10M,SCH STD,			
PIPE	8"	12"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B725 UNS N04400 ANNEALED(MONEL 400),ASME B36.10M,SCH 30,			
PIPE	14"	18"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B725 UNS N04400 ANNEALED(MONEL 400),ASME B36.10M,SCH 20,			
PIPE	20"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B725 UNS N04400 ANNEALED(MONEL 400),ASME B36.10M,SCH STD,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9, SCH STD,			
FITTING	8"	12"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH 30,			
FITTING	14"	18"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH 20,			
FITTING	20"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,SCH STD,			
FITTING	8"	12"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH 30,			
FITTING	14"	18"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH 20,			
FITTING	20"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	2"	6"	Cap, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,SCH STD,			
FITTING	8"	12"	Cap, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9, SCH 30,			
FITTING	14"	18"	Cap, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,SCH 20,			
FITTING	20"	24"	Cap, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),MSS SP-97,Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM B564 UNS N04400 ANNEALED(MONEL 400),MSS SP-97,Class 3000,			

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification	CONTRACTOR/CONSULTANT:   شركة طرح و ساخت مینا مجموعه طرح های صنایع نفت، گاز، پتروشیمی و نیرو											
							MC : 					
							Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.
Document Number:	3981-00-DE-PI-SPC-001											
						Rev.:	Page					
						01	106 of 216					



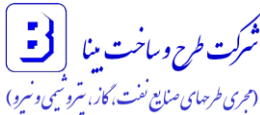

Piping Class:			R1A1			
Design Code:			ASME B31.3		Base Material:	Monel 400
Flange Rating & Facing:			150#	RF	Trim Material:	CN 11
Corrosion Allowance:			1.5		PWHT: No	
Service:			Corrosive Medium			
Design Temperature(C):			-29 to 38	50	100	
Design Pressure(Barg):			15.9	15.4	13.8	
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),MSS SP-97,			
FITTING	3"	6"	Reducer-Conc. Reducer, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,			
FITTING	8"	24"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,			
FITTING	3"	6"	Reducer-Ecc. Reducer, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,			
FITTING	8"	24"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM B366 GR.WPNC-S ANNEALED,MSS SP-95,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),MSS SP-83,Class 3000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM B165 UNS N04400 ANNEALED(MONEL 400),ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM B165 UNS N04400 ANNEALED(MONEL 400),ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM B165 UNS N04400 ANNEALED(MONEL 400),ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,SCH STD,			
FITTING	8"	12"	Tee-Straight, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,SCH 30,			
FITTING	14"	18"	Tee-Straight, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH 20,			
FITTING	20"	24"	Tee-Straight, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM B366 GR.WPNC-S ANNEALED,ASME B16.9,SCH STD,			
FITTING	8"	12"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,SCH 30,			
FITTING	14"	18"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH 20,			
FITTING	20"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 GR.WPNC-WX ANNEALED,ASME B16.9,SCH STD,			

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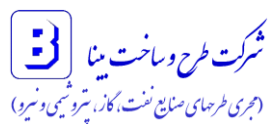

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	107 of 216

Piping Class:			R1A1			
Design Code:			ASME B31.3		Base Material:	Monel 400
Flange Rating & Facing:			150#	RF	Trim Material:	CN 11
Corrosion Allowance:			1.5		PWHT: No	
Service:			Corrosive Medium			
Design Temperature(C):			-29 to 38	50	100	
Design Pressure(Barg):			15.9	15.4	13.8	
FLANGE						
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.5,			
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.5,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.5,Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.5,Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.5,Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM B564 UNS N04400 ANNEALED(MONEL 400),ASME B16.5,Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM B725 UNS N04400 ANNEALED(MONEL 400),ASME B16.48,			
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM B725 UNS N04400 ANNEALED(MONEL 400),ASME B16.48,			
GASKET						
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,MONEL400 METALLIC+FLEXIBLE GRAPHITE CR: MONEL 400 - IR: MONEL 400,ASME B16.20,ASME B16.5,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,ZINC PLATING WITH CHROMATE COATED,			
VALVE						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,Body:ASTM B564 UNS N04400 ANNEALED(MONEL 400),TRIM: CN 11 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,			
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,Body:ASTM A494 M-35-1(MONEL 400),TRIM: CN 11 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,			
VALVE	10"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,Body:ASTM A494 M-35-1(MONEL 400),TRIM: CN 11 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594,FLANGED ASME B16.5,Self Operated,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,Body:ASTM B564 UNS N04400 ANNEALED(MONEL 400),TRIM: CN 11 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,Body:ASTM B564 UNS N04400 ANNEALED(MONEL 400),TRIM: CN 11 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602, SW/FNPT, ASME B16.11,HO,			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,Body:ASTM A494 M-35-1(MONEL 400),TRIM: CN 11 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,			
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,Body:ASTM A494 M-35-1(MONEL 400),TRIM: CN 11 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,Body:ASTM B564 UNS N04400 ANNEALED(MONEL 400),TRIM: CN 11 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11 HO			

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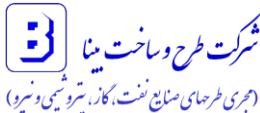

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
MC :  APG	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	108 of 216

Piping Class:			R1A1			
Design Code:			ASME B31.3		Base Material:	Monel 400
Flange Rating & Facing:			150#	RF	Trim Material:	CN 11
Corrosion Allowance:			1.5		PWHT: No	
Service:			Corrosive Medium			
Design Temperature(C):			-29 to 38	50	100	
Design Pressure(Barg):			15.9	15.4	13.8	
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,Body:ASTM A494 M-35-1(MONEL 400),TRIM: CN 11 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,			
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,Body:ASTM A494 M-35-1(MONEL 400),TRIM: CN 11 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5.GO.			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	109 of 216



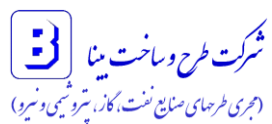

Piping Class:			T1A1				
Design Code:			ASME B31.3		Base Material:	LTCS	
Flange Rating & Facing:			150#	RF		Trim Material	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No	
Service:			Flare				
Design Temperature(C):			-45				
Design Pressure(Barg):			5.3				
PIPE							
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH XS,				
PIPE	2"	6"	Pipe,SMLS,BE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH STD,				
PIPE	8"	18"	Pipe,SMLS,BE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH 20,				
PIPE	20"	24"	Pipe,SMLS,BE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH STD,				
PIPE	26"	36"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A671 GR.CC70 CL22 S2,ASME B36.10M,LT System (-46C Impact Test),SCH STD,				
FITTING							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,				
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,				
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,				
FITTING	8"	18"	Elbow-45 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 20,				
FITTING	20"	24"	Elbow-45 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,				
FITTING	26"	36"	Elbow-45 LR, Welded 100% RT,BW,ASTM A420 WPL6W,ASME B16.9,LT System (-46C Impact Test),SCH STD,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,				
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH STD,				
FITTING	8"	18"	Elbow-90 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 20,				
FITTING	20"	24"	Elbow-90 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,				
FITTING	26"	36"	Elbow-90 LR, Welded 100% RT,BW,ASTM A420 WPL6W,ASME B16.9,LT System (-46C Impact Test),SCH STD,				
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,				
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,				
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,				
FITTING	2"	6"	Cap, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH STD,				
FITTING	8"	18"	Cap, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH 20,				
FITTING	20"	36"	Cap, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,				
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A350 LF2 CL1,MSS SP-97,LT System (-46C Impact Test),Class 3000,				
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,MSS SP-97,LT System (-46C Impact Test),Class 3000,				
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A350 LF2 CL1,MSS SP-97,LT System (-46C Impact Test),				
FITTING	3"	24"	Reducer-Conc. Reducer. SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),				

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	110 of 216



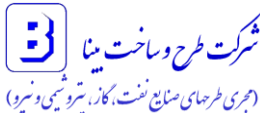

Piping Class:			T1A1			
Design Code:			ASME B31.3		Base Material:	LTCS
Flange Rating & Facing:			150#	RF	Trim Material	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Flare			
Design Temperature(C):			-45			
Design Pressure(Barg):			5.3			
FITTING	26"	36"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A420 WPL6W,ASME B16.9,LT System (-46C Impact Test),			
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),			
FITTING	26"	36"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A420 WPL6W,ASME B16.9,LT System (-46C Impact Test),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A350 LF2 CL1,MSS SP-83,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FITTING	8"	18"	Tee-Straight, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 20,			
FITTING	20"	24"	Tee-Straight, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FITTING	26"	36"	Tee-Straight, Welded 100% RT,BW,ASTM A420 WPL6W,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FITTING	8"	18"	Tee-Reducing, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 20,			
FITTING	20"	24"	Tee-Reducing, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FITTING	26"	36"	Tee-Reducing, Welded 100% RT,BW,ASTM A420 WPL6W,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FLANGE						

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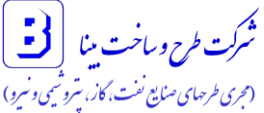
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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	111 of 216

Piping Class:			T1A1			
Design Code:			ASME B31.3		Base Material:	LTCS
Flange Rating & Facing:			150#	RF	Trim Material	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Flare			
Design Temperature(C):			-45			
Design Pressure(Barg):			5.3			
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A350 LF2 CL1,ASME B16.5,			
FLANGE	26"	36"	Flange, Blind,CL 150,RF,ASTM A350 LF2 CL1,ASME B16.47 Serial B,			
FLANGE	1/2"	24"	Flange, Blind,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.5,			
FLANGE	26"	36"	Flange, Blind,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.47 Serial B,			
FLANGE	1/2"	1 1/2"	Flange, SW,CL 150,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,			
FLANGE	2"	24"	Flange, WN,CL 150,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,			
FLANGE	26"	36"	Flange, WN,CL 150,RF,ASTM A350 LF2 CL1,ASME B16.47 Serial B,Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange, SW,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,			
FLANGE	2"	24"	Flange, WN,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,			
FLANGE	26"	36"	Flange, WN,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.47 Serial B,Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A516 GR.70,ASME B16.48,			
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A516 GR.70,ASME B16.48,			
BLINDS	26"	36"	Blanks and Spacers,CL 150,RF (RF),ASTM A516 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,			
BLINDS	1/2"	14"	Spectacle blind,CL 300,RF (RF),ASTM A516 GR.70,ASME B16.48,			
BLINDS	16"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A516 GR.70,ASME B16.48,			
BLINDS	26"	36"	Blanks and Spacers,CL 300,RF (RF),ASTM A516 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,			
GASKET						
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.5,4.5 mm,			
GASKET	26"	36"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.47 SERIES B,4.5 mm,			
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.5,4.5 mm,			
GASKET	26"	36"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.47 SERIES B,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A320 GR.L7,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,			
VALVE						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW ASME B16.11,Self Operated,LT System (-46C Impact Test),			
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,BS 1868,FLANGED ASME B16.5,Self Operated,LT Svstem (-46C Impact Test),			

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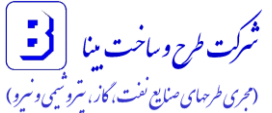

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	112 of 216

Piping Class:		T1A1			
Design Code:		ASME B31.3		Base Material:	LTCS
Flange Rating & Facing:		150#	RF		Trim Material
Corrosion Allowance:		1.5mm		PWHT:	No
Service:		Flare			
Design Temperature(C):		-45			
Design Pressure(Barg):		5.3			
VALVE	26"	30"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Spring: Inconel X750,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 594, ASME B16.47-B,Self Operated,LT System (-46C Impact Test),		
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW ASME B16.11,HO,LT System (-46C Impact Test),		
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW/FNPT, ASME B16.11,HO,LT System (-46C Impact Test),		
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 600,FLANGED ASME B16.5,HO,LT System (-46C Impact Test),		
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 600,FLANGED ASME B16.5,GO,LT System (-46C Impact Test),		
VALVE	26"	36"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 600,FLANGED ASME B16.47-B,GO,LT System (-46C Impact Test),		
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW ASME B16.11,HO,LT System (-46C Impact Test),		
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,BS 1873,FLANGED ASME B16.5,HO,LT System (-46C Impact Test),		
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,BS 1873,FLANGED ASME B16.5,GO,LT System (-46C Impact Test),		

OWNER:  MC : 	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	113 of 216



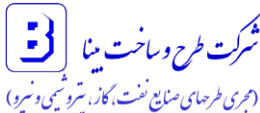

Piping Class:			T2A1			
Design Code:			ASME B31.3		Base Material:	LTCS
Flange Rating & Facing:			300#	RF	Trim Material:	CN12
Corrosion Allowance:			1.5mm			
Service:			Ethane, Propylene, Ethylene			
Design Temperature(C):			-45 to 38	50	100	150
Design Pressure(Barg):			51.1	50.1	46.6	45.1
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH XS,			
PIPE	2"	10"	Pipe,SMLS,BE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH STD,			
PIPE	12"	14"	Pipe,SMLS,BE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH 40,			
PIPE	16"	22"	Pipe,SMLS,BE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH XS,			
PIPE	24"	24"	Pipe,SMLS,BE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),SCH 30,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	2"	10"	Elbow-45 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH STD,			
FITTING	12"	14"	Elbow-45 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH 40,			
FITTING	16"	22"	Elbow-45 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH XS,			
FITTING	24"	24"	Elbow-45 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 30,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	2"	10"	Elbow-90 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FITTING	12"	14"	Elbow-90 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH 40,			
FITTING	16"	22"	Elbow-90 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH XS,			
FITTING	24"	24"	Elbow-90 LR, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 30,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,			
FITTING	2"	10"	Cap, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,			
FITTING	12"	14"	Cap, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 40,			
FITTING	16"	22"	Cap, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH XS,			
FITTING	24"	24"	Cap, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 30,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A350 LF2 CL1,MSS SP-97,LT System (-46C Impact Test),Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,MSS SP-97,LT System (-46C Impact Test),Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A350 LF2 CL1,MSS SP-97,LT System (-46C Impact Test),			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	114 of 216



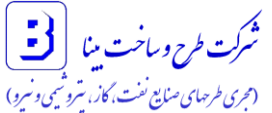

Piping Class:			T2A1					
Design Code:			ASME B31.3		Base Material:		LTCS	
Flange Rating & Facing:			300#	RF		Trim Material:		CN12
Corrosion Allowance:			1.5mm					
Service:			Ethane, Propylene, Ethylene					
Design Temperature(C):			-45 to 38	50		100		150
Design Pressure(Barg):			51.1	50.1		46.6		45.1
FITTING	3"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),					
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A420 WPL6,MSS SP-95,LT System (-46C Impact Test),					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,					
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A350 LF2 CL1,MSS SP-83,LT System (-46C Impact Test),Class 3000,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),Same as pipe,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A333 GR.6,ASME B36.10M,LT System (-46C Impact Test),Same as pipe,					
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,					
FITTING	2"	10"	Tee-Straight, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH STD,					
FITTING	12"	14"	Tee-Straight, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 40,					
FITTING	16"	22"	Tee-Straight, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH XS,					
FITTING	24"	24"	Tee-Straight, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 30,					
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A350 LF2 CL1,ASME B16.11,LT System (-46C Impact Test),Class 3000,					
FITTING	2"	10"	Tee-Reducing, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH STD,					
FITTING	12"	14"	Tee-Reducing, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test), SCH 40,					
FITTING	16"	22"	Tee-Reducing, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH XS,					
FITTING	24"	24"	Tee-Reducing, SMLS,BW,ASTM A420 WPL6,ASME B16.9,LT System (-46C Impact Test),SCH 30,					
FLANGE								
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.5,					

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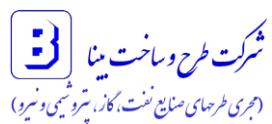

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	115 of 216

Piping Class:			T2A1							
Design Code:			ASME B31.3			Base Material:		LTCS		
Flange Rating & Facing:			300#		RF		Trim Material:		CN12	
Corrosion Allowance:			1.5mm							
Service:			Ethane, Propylene, Ethylene							
Design Temperature(C):			-45 to 38		50		100		150	
Design Pressure(Barg):			51.1		50.1		46.6		45.1	
FLANGE	1/2"	24"	Flange,Blind,CL 600,RF,ASTM A350 LF2 CL1,ASME B16.5,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A350 LF2 CL1,ASME B16.5,Same as pipe,							
BLIND										
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A516 GR.70,ASME B16.48,							
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A516 GR.70,ASME B16.48,							
BLINDS	1/2"	14"	Spectacle blind,CL 600,RF (RF),ASTM A516 GR.70,ASME B16.48,							
BLINDS	16"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A516 GR.70,ASME B16.48,							
GASKET										
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.5,4.5 mm,							
GASKET	26"	36"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.47 SERIES B,4.5 mm,							
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.5,4.5 mm,							
GASKET	26"	36"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: LTCS - IR: SS316,ASME B16.20,LT System (-46C Impact Test),ASME B16.47 SERIES B,4.5 mm,							
BOLT & NUT										
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A320 GR.L7,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,							
VALVE										
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW ASME B16.11,Self Operated,LT System (-46C Impact Test),							
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,BS 1868,FLANGED ASME B16.5,Self Operated,LT System (-46C Impact Test),							
VALVE	26"	30"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Spring: Inconel X750,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 594, ASME B16.47-B,Self Operated,LT System (-46C Impact Test),							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW ASME B16.11,HO,LT System (-46C Impact Test),							
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe F lexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW/FNPT, ASME B16.11,HO,LT System (-46C Impact Test),							
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 600,FLANGED ASME B16.5,HO,LT System (-46C Impact Test),							

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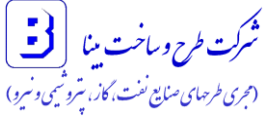
OWNER:  Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 	
MC : 	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	116 of 216

Piping Class:			T2A1			
Design Code:			ASME B31.3		Base Material:	LTCS
Flange Rating & Facing:			300#	RF	Trim Material:	CN12
Corrosion Allowance:			1.5mm			
Service:			Ethane, Propylene, Ethylene			
Design Temperature(C):			-45 to 38	50	100	150
Design Pressure(Barg):			51.1	50.1	46.6	45.1
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 600,FLANGED ASME B16.5,GO,LT System (-46C Impact Test),			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A350 LF2 CL1,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,API 602,SW ASME B16.11,HO,LT System (-46C Impact Test),			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,BS 1873,FLANGED ASME B16.5,HO,LT System (-46C Impact Test),			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A352 LCB,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 GR.L7,NUT:ASTM A194 GR.7,BS 1873,FLANGED ASME B16.5,GO,LT System (-46C Impact Test),			

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	117 of 216



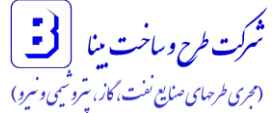

Piping Class:		AS-12 (DELETED)												
Design Code:		ASME B31.3					Base Material:			LAS (1 1/4Cr 1/2 Mo)				
Flange Rating & Facing:		300#		RF			Trim Material:			CN 5				
Corrosion Allowance:		1.5mm					PWHT:			Yes				
Service:		High Pressure Steam												
Design Temperature(C):		-29 to 38	50	100	150	200	250	300	325	350	375	400	400	425
Design Pressure(Barg):		51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2	33.7
PIPE														
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A335 P11,ASME B36.10M, SCH XS,											
PIPE	2"	10"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH STD,											
PIPE	12"	14"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH 40,											
PIPE	16"	16"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH XS,											
FITTING														
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,											
FITTING	2"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH STD,											
FITTING	12"	14"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 40,											
FITTING	16"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,											
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,											
FITTING	2"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH STD,											
FITTING	12"	14"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 40,											
FITTING	16"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,											
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F11 ,ASME B16.11,PWHT,Class 3000,											
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,											
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,											
FITTING	2"	10"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH STD,											
FITTING	12"	14"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 40,											
FITTING	16"	16"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,											
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F11 ,MSS SP-97, Class 3000,											
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F11 ,MSS SP-97, Class 3000,											
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F11 ,MSS SP-97,											
FITTING	3"	16"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,											
FITTING	3"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,											
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 ,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 GR.WP11 ,MSS SP-95,											
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 GR.WP11 ,MSS SP-95,											

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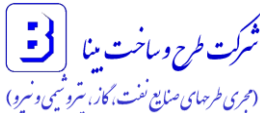

OWNER:  MC : 	PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification						CONTRACTOR/CONSULTANT:  	
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
							Rev.:	Page
Document Number:	3981-00-DE-PI-SPC-001						01	118 of 216

Piping Class:			AS-12 (DELETED)												
Design Code:			ASME B31.3					Base Material:		LAS (1 1/4Cr 1/2 Mo)					
Flange Rating & Facing:			300#		RF			Trim Material:		CN 5					
Corrosion Allowance:			1.5mm					PWHT:		Yes					
Service:			High Pressure Steam												
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	400	425
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2	33.7
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F11 ,MSS SP-83, Class 3000,												
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A335 P11,ASME B36.10M, Same as pipe,												
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A335 P11,ASME B36.10M, Same as pipe,												
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A335 P11,ASME B36.10M, Same as pipe,												
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	2"	10"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH STD,												
FITTING	12"	14"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 40,												
FITTING	16"	16"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,												
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	2"	10"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH STD,												
FITTING	12"	14"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 40,												
FITTING	16"	16"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,												
FLANGE															
FLANGE	1/2"	16"	Flange,Blind,CL 300,RF,ASTM A182 F11 ,ASME B16.5,												
FLANGE	1/2"	16"	Flange,Blind,CL 600,RF,ASTM A182 F11 ,ASME B16.5,												
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F11 ,ASME B16.5,Same as pipe,												
FLANGE	2"	16"	Flange,WN,CL 300,RF,ASTM A182 F11 ,ASME B16.5,Same as pipe,												
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F11 ,ASME B16.5,Same as pipe,												
FLANGE	2"	16"	Flange,WN,CL 600,RF,ASTM A182 F11 ,ASME B16.5,Same as pipe,												
BLIND															
BLINDS	1/2"	8"	Spectacle blind,CL 300,RF (RF),ASTM A387 GR.11 ,ASME B16.48,												
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A387 GR.11 ,ASME B16.48,												
GASKET															

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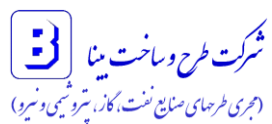

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	119 of 216

Piping Class:			AS-12 (DELETED)												
Design Code:			ASME B31.3						Base Material:		LAS (1 1/4Cr 1/2 Mo)				
Flange Rating & Facing:			300#			RF			Trim Material:		CN 5				
Corrosion Allowance:			1.5mm						PWHT:		Yes				
Service:			High Pressure Steam												
Design Temperature(C):			29 to 38	50	100	150	200	250	300	325	350	375	400	400	425
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2	33.7
GASKET	1/2"	16"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR, SS316,ASME B16.20,ASME B16.5,4.5 mm.												
GASKET	1/2"	16"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR, SS316,ASME B16.20,ASME B16.5,4.5 mm.												
BOLT & NUT															
STUD BOLT & NUT					Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B16,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,CERAMIC COATED.										
VALVE															
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,Self Operated,PWHT.												
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT.												
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT.												
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/FNPT ASME B16.11,HO,PWHT.												
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5(AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HO,PWHT.												
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT.												
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HO,PWHT.												

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	120 of 216



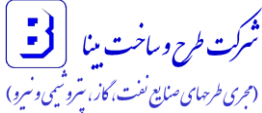

Piping Class:		AS-13					
Design Code:		ASME B31.3		Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		600#	RF	Trim Material:		CN 5	
Corrosion Allowance:		1.5mm		PWHT:		No	
Service:		High Pressure Steam, High Pressure Steam Condensate, Boiler Feed Water					
Design Temperature(C):		-29 to 38	50	100	150	200	300
Design Pressure(Barg):		102.1	100.2	93.2	90.2	87.6	79
PIPE							
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M ,SCH XS,				
PIPE	2"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,				
PIPE	10"	20"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH 80,				
FITTING							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,				
FITTING	2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,				
FITTING	10"	20"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,				
FITTING	2"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,				
FITTING	10"	20"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH80,				
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,				
FITTING	2"	8"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,				
FITTING	10"	20"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,				
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,				
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,				
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,				
FITTING	3"	20"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,				
FITTING	3"	20"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,				
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,				
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,				
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PE, Threaded Male one end,ASTM A234 WPB,MSS SP-95,				
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,				
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,				
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,				
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PE. Threaded Male one end,ASTM A234 WPB,MSS SP-95.				

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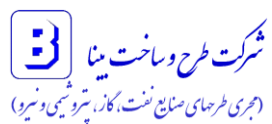

OWNER:  Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY					CONTRACTOR/CONSULTANT:  پناه صنعت پارت  شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	PROPANE DEHYDROGENATION (PDH) PROJECT						
MC :  APG	Piping Material Specification						
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.	
Document Number:	3981-00-DE-PI-SPC-001					Rev.: 01	Page 121 of 216

Piping Class:			AS-13					
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel		
Flange Rating & Facing:			600#	RF	Trim Material:	CN 5		
Corrosion Allowance:			1.5mm		PWHT:	No		
Service:			High Pressure Steam, High Pressure Steam Condensate, Boiler Feed Water					
Design Temperature(C):			-29 to 38	50	100	150	200	300
Design Pressure(Barg):			102.1	100.2	93.2	90.2	87.6	79
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,					
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PE, Threaded Male one end,ASTM A106 GR.B,ASME B36.10M,					
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH XS,					
FITTING	10"	20"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9, SCH 80,					
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,					
FITTING	10"	20"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,					
FLANGE								
FLANGE	1/2"	20"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.5,JOINTING FACE SERRATED					
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5,JOINTING FACE SERRATED					
FLANGE	2"	20"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5,JOINTING FACE SERRATED					
BLIND								
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,JOINTING FACE SERRATED,					
BLINDS	10"	20"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,JOINTING FACE SERRATED,					
GASKET								
GASKET	1/2"	20"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,No Special Requirement,ASME B16.5,4.5 mm,					
BOLT & NUT								
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2, Zinc plating with Chromate Coated,					
VALVE								
VALVE	1/2"	1 1/2"	CHECK VALVE BC BALL LIFT TYPE WITH SPRING,CL 800,WELDED SW,ASTM A105N,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,No Gasket,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/THRD ASME B16.11,Self Operated,					
VALVE	2"	16"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED (ALL EXCEPT BUTTERFLY) Flange, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,No Gasket,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,					

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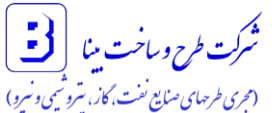

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	122 of 216

Piping Class:			AS-13						
Design Code:			ASME B31.3		Base Material:		Killed Carbon Steel		
Flange Rating & Facing:			600#	RF	Trim Material:		CN 5		
Corrosion Allowance:			1.5mm		PWHT:		No		
Service:			High Pressure Steam, High Pressure Steam Condensate, Boiler Feed Water						
Design Temperature(C):			-29 to 38	50	100	150	200	300	
Design Pressure(Barg):			102.1	100.2	93.2	90.2	87.6	79	
VALVE	2"	16"	CHECK VALVE DUAL PLATE,CL 600,WAFFER TYPE,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.5,Self Operated,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,WELDED SW,ASTM A105N,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/THRD ASME B16.11,HAND OPERATED,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,WELDED SW/FNPT,ASTM A105N,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/THRD(FNPT), ASME B16.11,HAND OPERATED,						
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED ,RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HAND OPERATED,						
VALVE	12"	16"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGE, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GEAR OPERATED / GEAR BOX,						
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,WELDED SW,ASTM A105N,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/THRD ASME B16.11,HAND OPERATED,						
VALVE	2"	4"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED,RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HAND OPERATED,						
VALVE	6"	16"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED,RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GEAR OPERATED / GEAR BOX,						
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 600,FLANGED END,RF, ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,HO,						
VALVE	6"	16"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 600, FLANGED END,RF, ASME B16.5,ASTM A216 WCB,SHAFT:13Cr, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,GO,						

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	123 of 216



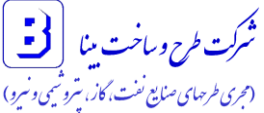

Piping Class:			AS-16																
Design Code:			ASME B31.3								Base Material:				LAS (1 1/4Cr 1/2 Mo)				
Flange Rating & Facing:			600#				RF				Trim Material:				CN 5				
Corrosion Allowance:			1.5 mm								PWHT:				Yes				
Service:			High Pressure Steam																
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425	450	475	500		
Design Pressure(Barg):			103.4	103.4	103	99.5	95.9	92.7	85.7	82.6	80.4	77.6	73.3	70	67.7	63.4	51.5		
PIPE																			
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A335 P11,ASME B36.10M , SCH XS,																
PIPE	2"	6"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH XS,																
PIPE	8"	8"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH 60,																
PIPE	10"	10"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH XS,																
PIPE	12"	16"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH 60,																
FITTING																			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F11 ,ASME B16.11,Class 3000,																
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,																
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,																
FITTING	8"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,																
FITTING	10"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,																
FITTING	12"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,																
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,																
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, ,Class 3000,																
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,																
FITTING	8"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,																
FITTING	10"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,																
FITTING	12"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,																
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F11 ,ASME B16.11, ,Class 3000,																
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F11 ,ASME B16.11, ,Class 3000,																
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, ,Class 3000,																
FITTING	2"	6"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,																
FITTING	8"	8"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,																
FITTING	10"	10"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,																
FITTING	12"	16"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,																
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F11 ,MSS SP-97, Class 3000,																
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 F11 ,MSS SP-97, Class 3000,																
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F11 ,MSS SP-97,																
FITTING	3"	16"	Reducer-Conc. Reducer. SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,																

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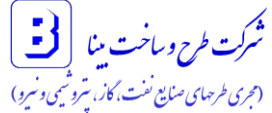

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی و طراحی)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	124 of 216

Piping Class:			AS-16															
Design Code:			ASME B31.3								Base Material:				LAS (1 1/4Cr 1/2 Mo)			
Flange Rating & Facing:			600#				RF				Trim Material:				CN 5			
Corrosion Allowance:			1.5 mm								PWHT:				Yes			
Service:			High Pressure Steam															
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	
Design Pressure(Barg):			103.4	103.4	103	99.5	95.9	92.7	85.7	82.6	80.4	77.6	73.3	70	67.7	63.4	51.5	
FITTING	3"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,															
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 ,MSS SP-95,															
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 GR.WP11 ,MSS SP-95,															
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PE, Threaded Male one end,ASTM A234 GR.WP11 ,MSS SP-95,															
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 ,MSS SP-95, ,															
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 ,MSS SP-95,															
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 GR.WP11 ,MSS SP-95,															
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc.,PE, Threaded Male one end,ASTM A234 GR.WP11 ,MSS SP-95,															
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 ,MSS SP-95, ,															
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F11 ,ASME B16.11, ,Class 3000,															
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, ,Class 3000,															
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F11 ,MSS SP-83, ,Class 3000,															
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A335 P11,ASME B36.10M, ,															
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A335 P11,ASME B36.10M, ,,															
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PE, Threaded Male one end,ASTM A335 P11,ASME B36.10M,															
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F11 ,ASME B16.11, ,Class 3000,															
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,PWHT,SCH XS,															
FITTING	8"	8"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,PWHT,SCH 60,															
FITTING	10"	10"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,PWHT,SCH XS,															
FITTING	12"	16"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,PWHT,SCH 60,															
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F11 ,ASME B16.11, ,Class 3000,															
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,															
FITTING	8"	8"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,															
FITTING	10"	10"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,															
FITTING	12"	16"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,															
FLANGE																		
FLANGE	1/2"	16"	Flange,Blind,CL 600,RF,ASTM A182 F11 ,ASME B16.5,JOINTING FACE SERRATED,															
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F11 ,ASME B16.5,JOINTING FACE SERRATED,															
FLANGE	2"	16"	Flange,WN,CL 600,RF,ASTM A182 F11 ,ASME B16.5,JOINTING FACE SERRATED,SCH SAME AS PIPE															

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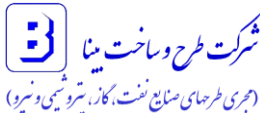

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 	
MC : 	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	125 of 216

Piping Class:			AS-16														
Design Code:			ASME B31.3							Base Material:			LAS (1 1/4Cr 1/2 Mo)				
Flange Rating & Facing:			600#			RF			Trim Material:			CN 5					
Corrosion Allowance:			1.5 mm							PWHT:			Yes				
Service:			High Pressure Steam														
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425	450	475	500
Design Pressure(Barg):			103.4	103.4	103	99.5	95.9	92.7	85.7	82.6	80.4	77.6	73.3	70	67.7	63.4	51.5
BLIND																	
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF),ASTM A387 GR.11 ,ASME B16.48,JOINTING FACE SERRATED,														
BLINDS	12"	16"	Blanks and Spacers,CL 600,RF (RF),ASTM A387 GR.11 ,ASME B16.48,JOINTING FACE SERRATED,														
GASKET																	
GASKET	1/2"	16"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR: SS316,ASME B16.20,No Special Requirement,ASME B16.5,4.5 mm,														
BOLT & NUT																	
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B16,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,CERAMIC COATED,														
VALVE																	
VALVE	1/2"	1 1/2"	CHECK VALVE BC BALL LIFT TYPE WITH SPRING,CL 800,WELDED SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/THRD ASME B16.11,Self Operated,PWHT,														
VALVE	2"	16"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED (ALL EXCEPT BUTTERFLY) Flange, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT,														
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,WELDED SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/THRD ASME B16.11,HAND OPERATED,PWHT,														
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,WELDED SW/FNPT,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/THRD(FNPT), ASME B16.11,HAND OPERATED,PWHT,														
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED,RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HAND OPERATED,PWHT,														
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,WELDED SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/THRD ASME B16.11,HAND OPERATED,PWHT,														
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED,RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HAND OPERATED,PWHT,														

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	126 of 216



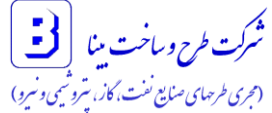

Piping Class:			MS-1			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Copper Alloy
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Circulating Water, Industrial Water,Domestic Water, Fire Water,PA、 Air			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,			
PIPE	2"	6"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,			
PIPE	8"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 20,			
PIPE	18"	18"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL21,ASME B36.10M,SCH 20,			
PIPE	20"	42"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL21,ASME B36.10M,SCH STD,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,			
FITTING	8"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 20,			
FITTING	18"	18"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 20,			
FITTING	20"	42"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,			
FITTING	8"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 20,			
FITTING	18"	18"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 20,			
FITTING	20"	42"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,			
FITTING	2"	6"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,			
FITTING	8"	18"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 20,			
FITTING	20"	42"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,			
FITTING	3"	16"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,			
FITTING	18"	42"	Reducer-Conc. Reducer. Welded 100% RT.BW.ASTM A234 WPBW.ASME B16.9.			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	127 of 216



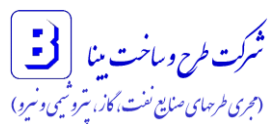

Piping Class:			MS-1			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Copper Alloy
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Circulating Water, Industrial Water,Domestic Water, Fire Water,PA、 Air			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
FITTING	3"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,			
FITTING	18"	42"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A106 GR.B,ASME B36.10M,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,			
FITTING	8"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 20,			
FITTING	18"	18"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 20,			
FITTING	20"	42"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,			
FITTING	8"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 20,			
FITTING	18"	18"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 20,			
FITTING	20"	42"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,			
FLANGE						
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A105,ASME B16.5,			
FLANGE	26"	42"	Flange,Blind,CL 150,RF,ASTM A105,ASME B16.47 Serial B,			
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,			

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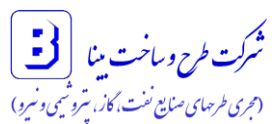

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	128 of 216

Piping Class:			MS-1			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Copper Alloy
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Circulating Water, Industrial Water,Domestic Water, Fire Water,PA、 Air			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
FLANGE	26"	42"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,			
FLANGE	26"	42"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,			
FLANGE	26"	42"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	26"	42"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,			
BLINDS	1/2"	14"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	16"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,			
BLINDS	26"	42"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,			
GASKET						
GASKET	1/2"	24"	Flat Ring Gasket,CL 150,For Use With RF Flange,316 METALLIC+REINFORCED GRAPHITE,ASME B16.21,ASME B16.5,3 mm,			
GASKET	26"	42"	Flat Ring Gasket,CL 150,For Use With RF Flange,316 METALLIC+REINFORCED GRAPHITE,ASME B16.21,ASME B16.47 SERIES B,3 mm,			
GASKET	1/2"	24"	Flat Ring Gasket,CL 300,For Use With RF Flange,316 METALLIC+REINFORCED GRAPHITE,ASME B16.21,ASME B16.5,3 mm,			
GASKET	26"	42"	Flat Ring Gasket,CL 300,For Use With RF Flange,316 METALLIC+REINFORCED GRAPHITE,ASME B16.21,ASME B16.47 SERIES B,3 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,			
VALVE						
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,			
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,			
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO.			

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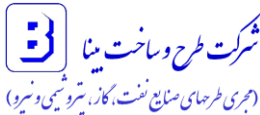

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	129 of 216

Piping Class:			MS-1			
Design Code:			ASME B31.3		Base Material:	Killed Carbon Steel
Flange Rating & Facing:			150#	RF	Trim Material:	Copper Alloy
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Circulating Water, Industrial Water,Domestic Water, Fire Water,PA、 Air			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
VALVE	1/2"	2"	CHECK VALVE TC SWING TYPE,CL 150, THRD (FNPT),Copper alloy ASTM B62 C83600,TRIM: ASTM B62,Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80,Self Operated,			
VALVE	3"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A395 ,TRIM: ASTM B584,Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN 12334,FLANGED ASME B16.5,Self Operated,			
VALVE	26"	38"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN8 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,			
VALVE	1/2"	2"	GATE VALVE UB OS&Y SOLID WEDGE,CL 150,THRD (FNPT),Copper alloy ASTM B62 C83600,DISC: PTFE, STEM & SEAT: B62,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80 ,HO,			
VALVE	3"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A395 ,TRIM: ASTM B584,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN 1171,FLANGED ASME B16.5,HO,			
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A395 ,TRIM: ASTM B584,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN 1171,FLANGED ASME B16.5,GO,			
VALVE	26"	36"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A395 ,TRIM: ASTM B584,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN 1171,FLANGED ASME B16.47-B,GO,			
VALVE	1/2"	2"	GLOBE VALVE UB OS&Y SWIVEL PLUG TYPE DISC,CL 150,THRD (FNPT),Copper alloy ASTM B62 C83600,DISC: PTFE, STEM & SEAT: B62,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80, HO,			
VALVE	3"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A395 ,TRIM: ASTM B584,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN 13789,FLANGED ASME B16.5,HO,			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A395 ,TRIM: ASTM B584,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN 13789,FLANGED ASME B16.5,GO,			
VALVE	3"	4"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150,WAFER / LUG,ASTM A395 ,SHAFT:316,DISC:AL-BRONZE, SEAT: BUNA-N, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,WAFER/LUG NON FLANGED,HO,			
VALVE	6"	24"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150,WAFER / LUG,ASTM A395 ,SHAFT:316,DISC:AL-BRONZE, SEAT: BUNA-N, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,WAFER/LUG NON FLANGED,GO,			
VALVE	26"	38"	BUTTERFLY VALVE DOUBLE OFFSET,CL 150,WAFER / LUG,ASTM A395 ,SHAFT:316,DISC:AL-BRONZE, SEAT: BUNA-N,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 609 CAT B,WAFER/LUG NON FLANGED,GO.			

OWNER:  Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	130 of 216



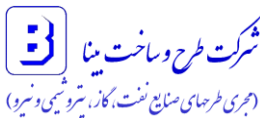

Piping Class:			MS-2			
Design Code:			ASME B31.3		Base Material:	Galv. CS
Flange Rating & Facing:			150#	RF	Trim Material:	Copper alloy
Corrosion Allowance:			0		PWHT:	No
Service:			Instrument Air, Domestic Water, Fire Water(Tank Area Spray)			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
PIPE						
PIPE	1/2"	2"	Pipe,SMLS,Threaded End (MNPT) with Coupling,ASTM A53 GR.B GALV.,ASME B36.10M,SCH XS,			
PIPE	2 1/2"	4"	Pipe,SMLS,Threaded End (MNPT) with Coupling,ASTM A53 GR.B GALV.,ASME B36.10M,SCH STD,			
PIPE	6"	6"	Pipe,SMLS,BE ,ASTM A53 GR.B GALV.,ASME B36.10M,SCH STD,			
FITTING						
FITTING	1/2"	4"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB GALV.,ASME B16.9,SCH STD,			
FITTING	1/2"	4"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Elbow-90 LR, SMLS ,BW,ASTM A234 WPB GALV.,ASME B16.9,SCH STD,			
FITTING	1/2"	4"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	1/2"	4"	Cap,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Cap, SMLS,BW,ASTM A234 WPB GALV,ASME B16.9,SCH STD,			
FITTING	3/4"	4"	Swage Nipple-Conc., SMLS,THRD(NPT-M),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	4"	6"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	3/4"	4"	Swage Nipple-Ecc., SMLS,THRD(NPT-M),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	4"	6"	Swage Nipple- Ecc, SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	1/2"	4"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	1/2"	4"	Union-Metallic Seal,Forged,THRD(NPT-M),ASTM A105 GALV.,MSS SP-83,Class 3000,			
FITTING	1/2"	2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A53 GR.B GALV.,ASME B36.10M,Same as pipe,			
FITTING	1/2"	4"	Tee-Straight,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB GALV.,ASME B16.9,SCH STD,			
FITTING	1/2"	4"	Tee-Reducing,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	1/2"	4"	Threadolet,THRD(NPT-F), ASTM A105 GALV.,ASME B16.11,Class 3000,			
FLANGE						
FLANGE	1/2"	6"	Flange,Blind,CL 150,RF,ASTM A105 GALV.,ASME B16.5,			
FLANGE	1/2"	4"	Flange, FNPT Flange,CL 150,RF,ASTM A105 GALV.,ASME B16.5,			
FLANGE	6"	6"	Flange, WN,CL 150,RF,ASTM A105 GALV.,ASME B16.5,sch same as pipe			
FLANGE	1/2"	6"	Flange,Blind,CL 300,RF,ASTM A105 GALV.,ASME B16.5,			
FLANGE	1/2"	4"	Flange, FNPT Flange,CL 300,RF,ASTM A105 GALV.,ASME B16.5,			

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OWNER:  Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY					CONTRACTOR/CONSULTANT:  پناه صنعت پارت  شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	PROPANE DEHYDROGENATION (PDH) PROJECT						
MC : 	Piping Material Specification						
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.	
Document Number:	3981-00-DE-PI-SPC-001					Rev.: 01	Page 131 of 216





FLANGE	6"	6"	Flange, WN,CL 300,RF,ASTM A105 GALV.,ASME B16.5, sch same as pipe
BLIND			
BLINDS	1/2"	4"	Spectacle blind,CL 150,RF ,ASTM A515 GR.70,ASME B16.48,
GASKET			
GASKET	1/2"	6"	Flat Ring,CL 150,For Use With RF Flange,PTFE,ASME B16.21,ASME B16.5,3.2 mm,
GASKET	1/2"	6"	Flat Ring,CL 300,For Use With RF Flange,PTFE,ASME B16.21,ASME B16.5,3.2 mm,
BOLT & NUT			
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,
VALVE			
VALVE	1/2"	1 1/2"	CHECK VALVE BC SWING TYPE,CL 150,Copper alloy ASTM B62,Copper alloy ASTM B62,Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80,THRD (FNPT),Self Operated,
VALVE	2"	3"	CHECK VALVE BC SWING TYPE,CL 150,Copper alloy ASTM B62,Copper alloy ASTM B62,Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80,THRD (FNPT),Self Operated,
VALVE	4"	4"	CHECK VALVE BC SWING TYPE,CL 150,Copper alloy ASTM B62,Copper alloy ASTM B62,Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80,THRD (FNPT),Self Operated,MFR
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,THRD(FNPT),Copper alloy ASTM B62,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80, ASME B16.11,HO,
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,Copper alloy ASTM B62,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80,FLANGED ASME B16.5,HO,
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,THRD,Copper alloy ASTM B62,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80,FNPT ASME B16.11,HO,
VALVE	2"	4"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,Copper alloy ASTM B62,TRIM: CN8 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,MSS SP-80,FLANGED ASME B16.5,HO,
VALVE	1/2"	2"	BALL, Body: Alloy B62, Ball&STEM:SS304, Seat: PTFE, CL150, FNPT, FB,HO, MSS-SP-110
VALVE	3"	3"	BALL, Body: Alloy B62, Ball&STEM:SS304, Seat: PTFE, CL150, RF, HO, MSS-SP-72

Note: Welded joints shall be touched up.

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، پیمانکاری، اجرا)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	132 of 216



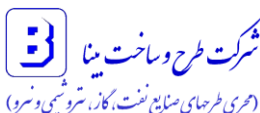

Piping Class:			MS-2U			
Design Code:			ASME B31.3		Base Material:	Galv. CS
Flange Rating & Facing:			150#	RF	Trim Material:	Copper alloy
Corrosion Allowance:			0		PWHT:	No
Service:			Potable Water (UG)			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.6		19.2	17.7
PIPE						
PIPE	1/2"	2"	Pipe,SMLS,Threaded End (MNPT) with Coupling,ASTM A53 GR.B GALV.,ASME B36.10M,SCH XS,			
PIPE	2 1/2"	4"	Pipe,SMLS,Threaded End (MNPT) with Coupling,ASTM A53 GR.B GALV.,ASME B36.10M,SCH STD,			
PIPE	6"	6"	Pipe,SMLS,BE ,ASTM A53 GR.B GALV.,ASME B36.10M,SCH STD,			
FITTING						
FITTING	1/2"	4"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB GALV.,ASME B16.9,SCH STD,			
FITTING	1/2"	4"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Elbow-90 LR, SMLS ,BW,ASTM A234 WPB GALV.,ASME B16.9,SCH STD,			
FITTING	1/2"	4"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	1/2"	4"	Cap,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Cap, SMLS,BW,ASTM A234 WPB GALV,ASME B16.9,SCH STD,			
FITTING	3/4"	4"	Swage Nipple-Conc., SMLS,THRD(NPT-M),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	4"	6"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	3/4"	4"	Swage Nipple-Ecc., SMLS,THRD(NPT-M),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	4"	6"	Swage Nipple- Ecc, SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB GALV.,MSS SP-95,			
FITTING	1/2"	4"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	1/2"	4"	Union-Metallic Seal,Forged,THRD(NPT-M),ASTM A105 GALV.,MSS SP-83,Class 3000,			
FITTING	1/2"	2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A53 GR.B GALV.,ASME B36.10M,Same as pipe,			
FITTING	1/2"	4"	Tee-Straight,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	6"	6"	Tee-Straight, SMLS,BW,ASTM A234 WPB GALV.,ASME B16.9,SCH STD,			
FITTING	1/2"	4"	Tee-Reducing,Forged,THRD(NPT-F),ASTM A105 GALV.,ASME B16.11,Class 3000,			
FITTING	1/2"	4"	Threadolet,THRD(NPT-F), ASTM A105 GALV.,ASME B16.11,Class 3000,			
FLANGE						
FLANGE	1/2"	6"	Flange,Blind,CL 150,RF,ASTM A105 GALV.,ASME B16.5,			
FLANGE	1/2"	4"	Flange, FNPT Flange,CL 150,RF,ASTM A105 GALV.,ASME B16.5,			
FLANGE	6"	6"	Flange, WN,CL 150,RF,ASTM A105 GALV.,ASME B16.5,sch same as pipe			
FLANGE	1/2"	6"	Flange,Blind,CL 300,RF,ASTM A105 GALV.,ASME B16.5,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی و ساخت، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	133 of 216



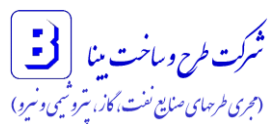

FLANGE	1/2"	4"	Flange, FNPT Flange, CL 300, RF, ASTM A105 GALV., ASME B16.5,
FLANGE	6"	6"	Flange, WN, CL 300, RF, ASTM A105 GALV., ASME B16.5, sch same as pipe
BLIND			
BLINDS	1/2"	4"	Spectacle blind, CL 150, RF, ASTM A515 GR.70, ASME B16.48,
GASKET			
GASKET	1/2"	6"	Flat Ring, CL 150, For Use With RF Flange, PTFE, ASME B16.21, ASME B16.5, 3.2 mm,
GASKET	1/2"	6"	Flat Ring, CL 300, For Use With RF Flange, PTFE, ASME B16.21, ASME B16.5, 3.2 mm,
BOLT & NUT			
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts, BOLT: ASTM A193 GR.B7, NUT: ASTM A194 GR.2H, ASME B1.1 ASME B18.2.1 ASME B18.2.2, Zinc plating with Chromate Coated,
VALVE			
VALVE	1/2"	1 1/2"	CHECK VALVE BC SWING TYPE, CL 150, Copper alloy ASTM B62, Copper alloy ASTM B62, Hinge Pin : 316 SS, ASTM A193 Gr.B7 / ASTM A194 Gr.2H, MSS SP-80, THRD (FNPT), Self Operated,
VALVE	2"	3"	CHECK VALVE BC SWING TYPE, CL 150, Copper alloy ASTM B62, Copper alloy ASTM B62, Hinge Pin : 316 SS, ASTM A193 Gr.B7 / ASTM A194 Gr.2H, MSS SP-80, THRD (FNPT), Self Operated,
VALVE	4"	4"	CHECK VALVE BC SWING TYPE, CL 150, Copper alloy ASTM B62, Copper alloy ASTM B62, Hinge Pin : 316 SS, ASTM A193 Gr.B7 / ASTM A194 Gr.2H, MSS SP-80, THRD (FNPT), Self Operated, MFR
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE, CL 800, THRD (FNPT), Copper alloy ASTM B62, TRIM: CN8 (AS PER API 600), Packing For Gate & Globe Flexible Graphite, MNFR, ASTM A193 Gr.B7 / ASTM A194 Gr.2H, MSS SP-80, ASME B16.11, HO,
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE, CL 150, FLANGED, RF, Copper alloy ASTM B62, TRIM: CN8 (AS PER API 600), Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H, MSS SP-80, FLANGED ASME B16.5, HO,
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC, CL 800, THRD, Copper alloy ASTM B62, TRIM: CN8 (AS PER API 600), Packing For Gate & Globe Flexible Graphite, MNFR, ASTM A193 Gr.B7 / ASTM A194 Gr.2H, MSS SP-80, FNPT ASME B16.11, HO,
VALVE	2"	4"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC, CL 150, FLANGED, RF, Copper alloy ASTM B62, TRIM: CN8 (AS PER API 600), Packing For Gate & Globe Flexible Graphite, MNFR, ASTM A193 Gr.B7 / ASTM A194 Gr.2H, MSS SP-80, FLANGED ASME B16.5, HO,

Note: Welded joints shall be touched up.

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	Piping Material Specification						CONTRACTOR/CONSULTANT:  	
								Project Code Sec. Phase Code Department Doc. Type Serial No.
	MC : 							
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 134 of 216



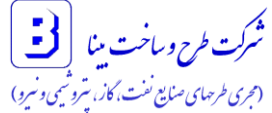

Piping Class:			MS-5			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN2
Corrosion Allowance:			1.5 mm		PWHT:	No
Service:			Desalted Water 、 Lubricants, Chemicals, Demineralized Water			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.0		18.4	16.2
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304/304L,ASME B36.19M,SCH 80S,			
PIPE	2"	6"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,SCH 40S,			
PIPE	8"	18"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M, SCH 20,			
PIPE	20"	20"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M,SCH STD,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	8"	18"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 20,			
FITTING	20"	20"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	8"	18"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 20,			
FITTING	20"	20"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	2"	6"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	8"	18"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 20,			
FITTING	20"	20"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F304/304L,MSS SP-97,Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F304,MSS SP-97,Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F304/304L,MSS SP-97,			
FITTING	3"	20"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,			
FITTING	3"	20"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc.. SMLS,POE/TOE,ASTM A403 GR.WP304/304L-S,MSS SP-95.			

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification							CONTRACTOR/CONSULTANT:  	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						01	135 of 216



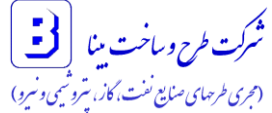

Piping Class:			MS-5			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN2
Corrosion Allowance:			1.5 mm		PWHT:	No
Service:			Desalted Water 、 Lubricants, Chemicals, Demineralized Water			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.0		18.4	16.2
FITTING	2"	4"	Swage Nipple-Conc., SMLS, Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F304/304L,MSS SP-83,Class 3000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A312 TP304/304L,ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A312 TP304,ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,POE/TOE,ASTM A312 TP304/304L,ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	8"	18"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 20,			
FITTING	20"	20"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH STD,			
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	8"	18"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 20,			
FITTING	20"	20"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH STD,			
FLANGE						
FLANGE	1/2"	20"	Flange,Blind,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,			
FLANGE	1/2"	20"	Flange,Blind,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
FLANGE	2"	20"	Flange,WN,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
FLANGE	2"	20"	Flange,WN,CL 150,FF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
FLANGE	2"	20"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,			

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification							CONTRACTOR/CONSULTANT:  	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 136 of 216



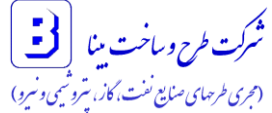

Piping Class:			MS-5			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN2
Corrosion Allowance:			1.5 mm		PWHT:	No
Service:			Desalted Water 、 Lubricants, Chemicals, Demineralized Water			
Design Temperature(C):			-29 to 38		50	100
Design Pressure(Barg):			19.0		18.4	16.2
BLINDS	12"	20"	Blanks and Spacers,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,			
GASKET						
GASKET	1/2"	20"	SPWgasket,CL 150,For Use With RF Flange,304 METALLIC+FLEXIBLE GRAPHITE W/CR: cs - IR: SS304,ASME B16.20,ASME B16.5,4.5 mm,			
GASKET	1/2"	20"	SPWgasket,CL 300,For Use With RF Flange,304 METALLIC+FLEXIBLE GRAPHITE W/CR: cs - IR: SS304,ASME B16.20,ASME B16.5,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						
VALVE	1/2"	1 1/2"	CHECK VALVE BC BALL LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304,TRIM: CN2 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 608,SW ASME B16.11,Self Operated,			
VALVE	2"	20"	CHECK VALVE BC DUAL PLATE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F304,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.or-5M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F304,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.or-5M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,			
VALVE	14"	20"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,GO,			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F304,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,			
VALVE	2"	8"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,HO,			
VALVE	10"	20"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,GO,			
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182F304/304L,STEM & BALL: 316, SEAT:316+RPTFE,Seal For Ball Valve AED Viton ,ASTM A193 Gr.B8M /ASTM A194 Gr.8MA,BS EN ISO 17292,FLANGED ASME B16.5,HO,			
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194Gr.8MA,API 608,FLANGED ASME B16.5,HO,			
VALVE	6"	20"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM ASTM A351CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton ,ASTM A193 Gr.B8M /ASTM A194 Gr.8MA,API 6D,FLANGED ASME B16.5,GO,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	137 of 216

Piping Class:		MS-5U						
Design Code:		ASME B31.3		Base Material:		GRVE		
Flange Rating & Facing:		150#	FF	Trim Material:		CN2		
Corrosion Allowance:		0 mm			PWHT:		No	
Service:		Desalted Water(UG) 、 Desalinated Water (UG)						
Design Temperature(C):		-29 to 65						
Design Pressure(Barg):		17						
PIPE								
PIPE	1/2"	16"	GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D2996 & MFR. STD., THK AS PER MFR. STD.					
FITTING								
FITTING	1/2"	16"	Elbow-45, LR, GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D5685 & MFR. STD., THK AS PER MFR. STD.					
FITTING	1/2"	16"	Elbow-90, LR, GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D5685 & MFR. STD., THK AS PER MFR. STD.					
FITTING	1/2"	16"	REDUCER, ECC, GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D5685 & MFR. STD., THK AS PER MFR. STD.					
FITTING	1/2"	16"	REDUCER, CONC, GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D5685 & MFR. STD., THK AS PER MFR. STD.					
FITTING	1/2"	16"	TEE-STRAIGHT,GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D5685 & MFR. STD., THK AS PER MFR. STD.					
FITTING	1/2"	16"	TEE-REDUCING,GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D5685 & MFR. STD., THK AS PER MFR. STD.					
FITTING	1/2"	16"	CAP,GRVE, FILAMENT WOUND FIBERGLASS, API-15LR/AWWA C950, ASTM D2992, PN-20 (Barg), SN-10000 (Pa), BIAxIAL, BUTT&WRAP LAMINATION JOINT, AS PER D5685 & MFR. STD., THK AS PER MFR. STD.					
FLANGE								
FLANGE	1/2"	16"	Flange,Blind, GRVE, FILAMENT WOUND FIBERGLASS, FF, CL.150, AS PER ASME B16.5, BUTT&WRAP LAMINATION JOINT, PN20, AS PER D4024, MFR. STD.					
FLANGE	1/2"	16"	Flange,Blind, GRVE, FILAMENT WOUND FIBERGLASS, FF, CL.300, AS PER ASME B16.5, BUTT&WRAP LAMINATION JOINT, PN20, AS PER D4024, MFR. STD.					
FLANGE	1/2"	16"	Flange,GRVE, FILAMENT WOUND FIBERGLASS, FF, CL.150, AS PER ASME B16.5, BUTT&WRAP LAMINATION JOINT, PN20,AS PER D4024, MFR. STD.					
FLANGE	1/2"	16"	Flange,GRVE, FILAMENT WOUND FIBERGLASS, FF, CL.300, AS PER ASME B16.5, BUTT&WRAP LAMINATION JOINT, PN20, AS PER D4024, MFR. STD.					
BLIND								
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,					
BLINDS	12"	16"	Blanks and Spacers,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,					
GASKET								
GASKET	1/2"	16"	NEOPRENE RUBBER FULL FACE, CL.150, 5 mm THK., AS PER ASME B16.21, B16.5					
GASKET	1/2"	16"	NEOPRENE RUBBER FULL FACE, CL.300, 5 mm THK., AS PER ASME B16.21, B16.5					
BOLT & NUT								



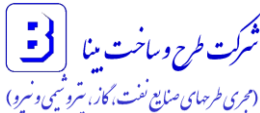

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 	
MC : 	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	138 of 216



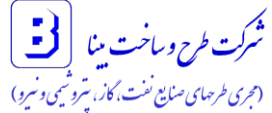

Piping Class:			MS-5U			
Design Code:			ASME B31.3		Base Material:	GRVE
Flange Rating & Facing:			150#	FF	Trim Material:	CN2
Corrosion Allowance:			0 mm		PWHT:	No
Service:			Desalted Water(UG) 、 Desalinated Water (UG)			
Design Temperature(C):			-29 to 65			
Design Pressure(Barg):			17			
STUD BOLT & NUT			Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						
VALVE	1/2"	16"	CHECK VALVE BC DUAL PLATE,CL 150,FLANGED, FF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,			
VALVE	1/2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, FF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 600,FLANGED ASME B16.5,HO,			
VALVE	14"	16"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, FF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 600,FLANGED ASME B16.5,GO,			
VALVE	1/2"	8"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, FF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,HO,			
VALVE	10"	16"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, FF,ASTM A351 CF8,TRIM: CN2 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,GO,			

Note:

SN of piping components and branch table of GRVE will be finalized based on Manufacturer STD, after P.O



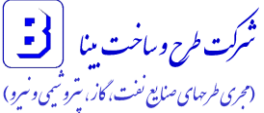

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	139 of 216

Piping Class:		MS-7	
Design Code:		ASME B31.3	Base Material: S.S 316
Pressure range:		800 psig	
Flange rating & Facing		CL600/RF	
Corrosion Allowance:		0 mm	PWHT: No
Service:		Tubing	
Design Temperature(C):		-29 to 425	
Design Pressure:		800 psig	
Tube			
TUBE	1/4"(OD)	3/8"(OD)	ASTM A 269 Grade TP316,PE,SMLS,0.035 inch (0.89 mm) minimum wall thickness, MANUF. STD
TUBE	1/2"(OD)	1"(OD)	ASTM A 269 Grade TP316,SMLS,PE,0.049 inch (1.25 mm) minimum wall thickness, MANUF. STD
FITTING			
FITTING	1/4"	1"	Connector(tubing), DOUBLE FERRULE BITE/NPT, CONNECTOR FEMALE FORGED DOUBLE FERRULE BITE/NPT MANUF. STD, ASTM A182 GR. F316 (Connector pipe to tube)
FITTING	1/4"	1"	Connector(tubing), DOUBLE FERRULE BITE/NPT, CONNECTOR MALE FORGED DOUBLE FERRULE BITE/NPT MANUF. STD, ASTM A182 GR. F316(Connector pipe to tube)
FITTING	1/4"	1"	UNION 90 DEG FORGED DOUBLE FERRULE BITE MANUF. STD,ASTM A182 GR. F316
FITTING	1/4"	1"	UNION EQ. FORGED DOUBLE FERRULE BITE MANUF. STD,ASTM A182 GR. F316
FITTING	1/4"	1"	UNION RED. FORGED DOUBLE FERRULE BITE MANUF. STD,ASTM A182 GR. F316
FITTING	1/4"	1"	UNION TEE EQ. FORGED DOUBLE FERRULE BITE MANUF. STD, ASTM A182 GR. F316
FITTING	1/4"	1/4"	UNION TEE RED. FORGED DOUBLE FERRULE BITE MANUF. STD, ASTM A182 GR. F316
FLANGE			
FLANGE	1/4"	1"	Flange,DOUBLE FERRULE,CL 600,RF,ASTM A182 GR.F316,TO MATCH ASME B16.5, MANUF. STD
BLIND			
BLINDS	1/2"	1"	Spectacle blind,CL 600,RF (RF), ASTM A182 GR.F316,ASME B16.48,
GASKET			
GASKET	1/4"	1"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+FLEXIBLE GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,
BOLT & NUT			
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 140 of 216



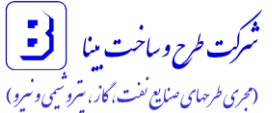

Piping Class:		MS-11						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		150#	RF		Trim Material:		CN 5	
Corrosion Allowance:		1.5 mm			PWHT:		No	
Service:		Low Pressure Steam, Low Pressure Steam Condensate						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
PIPE								
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,					
PIPE	2"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,					
PIPE	12"	12"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,					
PIPE	14"	24"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,					
PIPE	26"	32"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,SCH STD,					
PIPE	34"	48"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,SCH XS,					
FITTING								
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	12"	12"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,					
FITTING	14"	24"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	26"	32"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,					
FITTING	34"	48"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	12"	12"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,					
FITTING	14"	24"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	26"	32"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,					
FITTING	34"	48"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,					
FITTING	2"	6"	Elbow-90 SR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,					
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,					
FITTING	2"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	12"	12"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,					
FITTING	14"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,					
FITTING	26"	32"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD.					

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	141 of 216



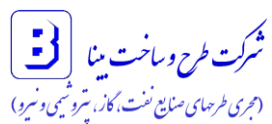

Piping Class:			MS-11													
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel								
Flange Rating & Facing:			150#		RF		Trim Material:		CN 5							
Corrosion Allowance:			1.5 mm			PWHT:		No								
Service:			Low Pressure Steam, Low Pressure Steam Condensate													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.6		19.2		17.7		15.8		13.8		12.1		10.2	
FITTING	34"	48"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,													
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,													
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,													
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,													
FITTING	3"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,													
FITTING	26"	48"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,													
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,													
FITTING	26"	48"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,													
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,													
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,													
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,													
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,													
FITTING	1/2"	1 1/2"	Coupling-Half Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Coupling- Half Coupling,Forged, THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,													
FITTING	2"	10"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,													
FITTING	12"	12"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,													
FITTING	14"	24"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,													
FITTING	26"	32"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,													
FITTING	34"	48"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,													

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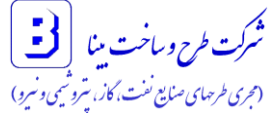

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 142 of 216

Piping Class:			MS-11							
Design Code:			ASME B31.3			Base Material:		Killed Carbon Steel		
Flange Rating & Facing:			150#		RF		Trim Material:		CN 5	
Corrosion Allowance:			1.5 mm			PWHT:		No		
Service:			Low Pressure Steam, Low Pressure Steam Condensate							
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	
Design Pressure(Barg):			19.6	19.2	17.7	15.8	13.8	12.1	10.2	
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,							
FITTING	2"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	12"	12"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,							
FITTING	14"	24"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,							
FITTING	26"	32"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH STD,							
FITTING	34"	48"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH XS,							
FLANGE										
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A105,ASME B16.5,							
FLANGE	26"	48"	Flange,Blind,CL 150,RF,ASTM A105,ASME B16.47 Serial B,							
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,							
FLANGE	26"	48"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	48"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,							
FLANGE	26"	48"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,							
BLIND										
BLINDS	1/2"	14"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	16"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	26"	48"	Blanks and Spacers,CL 150,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,							
BLINDS	1/2"	14"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	16"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,							
BLINDS	26"	48"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,							
GASKET										
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
GASKET	26"	48"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,							
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,							
GASKET	26"	48"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,							

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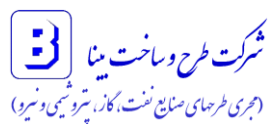

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	143 of 216

Piping Class:		MS-11						
Design Code:		ASME B31.3			Base Material:		Killed Carbon Steel	
Flange Rating & Facing:		150#	RF		Trim Material:		CN 5	
Corrosion Allowance:		1.5 mm			PWHT:		No	
Service:		Low Pressure Steam, Low Pressure Steam Condensate						
Design Temperature(C):		-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2
BOLT & NUT								
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,					
VALVE								
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,					
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,					
VALVE	26"	48"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,					
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,					
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,					
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,					
VALVE	26"	36"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,					
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,					
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,					
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,					

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	144 of 216



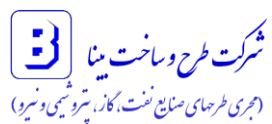

Piping Class:			MS-12									
Design Code:			ASME B31.3				Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#		RF		Trim Material:		CN 5			
Corrosion Allowance:			1.5 mm				PWHT:		No			
Service:			Medium Pressure Steam, Medium Pressure Steam Condensate									
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6	36.4
PIPE												
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,									
PIPE	2"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH STD,									
PIPE	12"	14"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,									
PIPE	16"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,									
PIPE	18"	24"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 40,									
PIPE	26"	32"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 20.62 mm,									
PIPE	42"	42"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 B65 CL22,ASME B36.10M,THK. 20.62 mm,									
FITTING												
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,									
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,									
FITTING	2"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,									
FITTING	12"	14"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	16"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,									
FITTING	18"	24"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	26"	42"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,									
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,									
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,									
FITTING	2"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,									
FITTING	12"	14"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	16"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,									
FITTING	18"	24"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	26"	42"	Elbow-90 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,									
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,									
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,									
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,									
FITTING	2"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,									
FITTING	12"	14"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	16"	16"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,									
FITTING	18"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	145 of 216



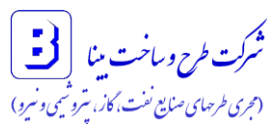

Piping Class:			MS-12									
Design Code:			ASME B31.3					Base Material:		Killed Carbon Steel		
Flange Rating & Facing:			300#		RF			Trim Material:		CN 5		
Corrosion Allowance:			1.5 mm					PWHT:		No		
Service:			Medium Pressure Steam, Medium Pressure Steam Condensate									
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6	36.4
FITTING	26"	42"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,THK. 20.62 mm,									
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,									
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,									
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,									
FITTING	2 1/2"	24"	Reducer-Conc. Reducer,Wrought SMLS,BW,ASTM A234 WPB,ASME B16.9,									
FITTING	26"	42"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,									
FITTING	2 1/2"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,									
FITTING	26"	42"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,									
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,									
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,									
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,									
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,									
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,									
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,									
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,									
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,									
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,									
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,									
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,									
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,									
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,									
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,									
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,									
FITTING	2"	10"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,									
FITTING	12"	14"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	16"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,									
FITTING	18"	24"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	26"	42"	Tee-Straight, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,									
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,									
FITTING	2"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH STD,									

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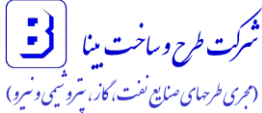

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	146 of 216

Piping Class:			MS-12									
Design Code:			ASME B31.3				Base Material:		Killed Carbon Steel			
Flange Rating & Facing:			300#		RF		Trim Material:		CN 5			
Corrosion Allowance:			1.5 mm				PWHT:		No			
Service:			Medium Pressure Steam, Medium Pressure Steam Condensate									
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6	36.4
FITTING	12"	14"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	16"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,									
FITTING	18"	24"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 40,									
FITTING	26"	42"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,THK. 20.62 mm,									
FLANGE												
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.5,									
FLANGE	26"	32"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,									
FLANGE	1/2"	24"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.5,									
FLANGE	26"	42"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.47 Serial B,									
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,									
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,									
FLANGE	26"	42"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,									
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,									
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,									
FLANGE	26"	42"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.47 Serial B,Same as pipe,									
BLIND												
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,									
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,									
BLINDS	26"	42"	Blanks and Spacers,CL 300,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,									
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,									
BLINDS	10"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,									
BLINDS	26"	42"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,as per project spec. 3981-00-BA-PI-SPC-022,									
GASKET												
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,									
GASKET	26"	42"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,									
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,									
GASKET	26"	42"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,									
BOLT & NUT												

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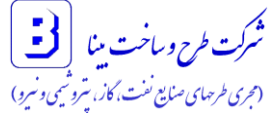

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	147 of 216

Piping Class:			MS-12									
Design Code:			ASME B31.3					Base Material:		Killed Carbon Steel		
Flange Rating & Facing:			300#		RF			Trim Material:		CN 5		
Corrosion Allowance:			1.5 mm					PWHT:		No		
Service:			Medium Pressure Steam, Medium Pressure Steam Condensate									
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375
Design Pressure(Barg):			51.1	50.1	46.6	45.1	43.8	41.9	39.8	38.7	37.6	36.4
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Ceramic Coated,									
VALVE												
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,									
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,									
VALVE	26"	32"	CHECK VALVE, RETAINERLESS CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 594, ASME B16.47-B,Self Operated,MFR									
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,									
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,									
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,									
VALVE	12"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,									
VALVE	26"	32"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.47-B,GO,									
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,									
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,									
VALVE	8"	8"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,									

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	148 of 216



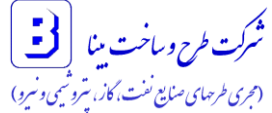

Piping Class:			MS-13											
Design Code:			ASME B31.3					Base Material:			Killed Carbon Steel			
Flange Rating & Facing:			600#		RF			Trim Material:			CN 5			
Corrosion Allowance:			1.5mm					PWHT:			No			
Service:			High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water											
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425
Design Pressure(Barg):			102.1	100.2	93.2	90.2	87.6	83.9	79.6	77.4	75.1	72.7	69.4	57.5
PIPE														
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A106 GR.B,ASME B36.10M,SCH XS,											
PIPE	2"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M, SCH XS,											
PIPE	10"	16"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 80,											
PIPE	18"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A672 GR.B65 CL22,ASME B36.10M, SCH 80,											
FITTING														
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,											
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,											
FITTING	2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,											
FITTING	10"	16"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,											
FITTING	18"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 80,											
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A105,ASME B16.11,Class 3000,											
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,											
FITTING	2"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,											
FITTING	10"	16"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,											
FITTING	18"	24"	Elbow-90 LR,Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 80,											
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A105,ASME B16.11,Class 3000,											
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A105,ASME B16.11,Class 3000,											
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,											
FITTING	2"	8"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,											
FITTING	10"	24"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,											
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A105,MSS SP-97,Class 3000,											
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A105,MSS SP-97,Class 3000,											
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,											
FITTING	2"	16"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,											
FITTING	18"	24"	Reducer-Conc. Reducer,Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,											
FITTING	2"	16"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,											
FITTING	18"	24"	Reducer-Ecc. Reducer,Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,											
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,											

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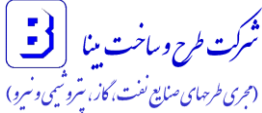

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	149 of 216

Piping Class:			MS-13											
Design Code:			ASME B31.3						Base Material:			Killed Carbon Steel		
Flange Rating & Facing:			600#			RF			Trim Material:			CN 5		
Corrosion Allowance:			1.5mm						PWHT:			No		
Service:			High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water											
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425
Design Pressure(Barg):			102.1	100.2	93.2	90.2	87.6	83.9	79.6	77.4	75.1	72.7	69.4	57.5
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 WPB,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,											
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 WPB,MSS SP-95,											
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 WPB,MSS SP-95,											
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 WPB,MSS SP-95,											
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A105,ASME B16.11,Class 3000,											
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A105,ASME B16.11,Class 3000,											
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A105,MSS SP-83,Class 3000,											
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,											
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A106 GR.B,ASME B36.10M,Same as pipe,											
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,POE/TOE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,											
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A105,ASME B16.11,Class 3000,											
FITTING	2"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,											
FITTING	2"	8"	Lateral Tee-Straight,45 DEG, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,											
FITTING	10"	16"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,											
FITTING	18"	24"	Tee-Straight,Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 80,											
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A105,ASME B16.11,Class 3000,											
FITTING	2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,											
FITTING	2"	8"	Lateral Tee-Reducing, 45 DEG, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,											
FITTING	10"	16"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,											
FITTING	18"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM A234 WPBW,ASME B16.9,SCH 80,											
FLANGE														
FLANGE	1/2"	24"	Flange,Blind,CL 600,RF,ASTM A105,ASME B16.5,											
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,											
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A105,ASME B16.5,Same as pipe,											
BLIND														
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,											
BLINDS	10"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A515 GR.70,ASME B16.48,											
GASKET														

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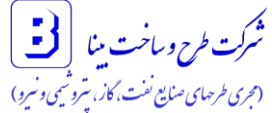

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	150 of 216

Piping Class:			MS-13											
Design Code:			ASME B31.3					Base Material:		Killed Carbon Steel				
Flange Rating & Facing:			600#		RF			Trim Material:		CN 5				
Corrosion Allowance:			1.5mm					PWHT:		No				
Service:			High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water											
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425
Design Pressure(Barg):			102.1	100.2	93.2	90.2	87.6	83.9	79.6	77.4	75.1	72.7	69.4	57.5
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,											
BOLT & NUT														
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Ceramic Coated,											
VALVE														
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,Self Operated,											
VALVE	2"	16"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1868,FLANGED ASME B16.5,Self Operated,											
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,											
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW/FNPT, ASME B16.11,HO,											
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,HO,											
VALVE	10"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 600,FLANGED ASME B16.5,GO,											
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A105,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 602,SW ASME B16.11,HO,											
VALVE	2"	4"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,HO,											
VALVE	6"	16"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A216 WCB,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS 1873,FLANGED ASME B16.5,GO,											

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	151 of 216



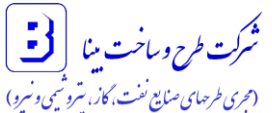

Piping Class:			MS-16												
Design Code:			ASME B31.3						Base Material:			AS (1 1/4Cr ½ Mo)			
Flange Rating & Facing:			600#		RF			Trim Material:			CN 5				
Corrosion Allowance:			1.5mm						PWHT:			Yes			
Service:			High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water												
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450
Design Pressure(Barg):			103.4	103.4	103.0	99.5	95.9	92.7	85.7	82.6	80.4	77.6	73.3	70.0	67.7
PIPE															
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A335 P11,ASME B36.10M, SCH XS,												
PIPE	2"	10"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH XS,												
PIPE	12"	24"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M, SCH 60,												
FITTING															
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	2"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,												
FITTING	12"	24"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,												
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	2"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,												
FITTING	12"	24"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,												
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	2"	10"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,												
FITTING	12"	24"	Cap, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,												
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F11 ,MSS SP-97, Class 3000,												
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F11 ,MSS SP-97, Class 3000,												
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F11 ,MSS SP-97,												
FITTING	3"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,												
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9,												
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 ,MSS SP-95, ,												
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc.,Wrought SMLS,PLE/TSE,ASTM A234 GR.WP11 ,MSS SP-95,												

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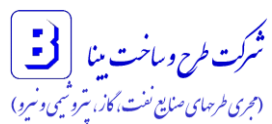

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 152 of 216

Piping Class:			MS-16												
Design Code:			ASME B31.3						Base Material:			AS (1 1/4Cr ½ Mo)			
Flange Rating & Facing:			600#		RF				Trim Material:			CN 5			
Corrosion Allowance:			1.5mm						PWHT:			Yes			
Service:			High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water												
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450
Design Pressure(Barg):			103.4	103.4	103.0	99.5	95.9	92.7	85.7	82.6	80.4	77.6	73.3	70.0	67.7
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 ,MSS SP-95,												
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F11 ,MSS SP-83, Class 3000,												
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A335 P11,ASME B36.10M, Same as pipe,												
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A335 P11,ASME B36.10M, Same as pipe,												
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A335 P11,ASME B36.10M, Same as pipe,												
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	2"	10"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,												
FITTING	12"	24"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,												
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F11 ,ASME B16.11, Class 3000,												
FITTING	2"	10"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH XS,												
FITTING	12"	24"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 ,ASME B16.9, SCH 60,												
FLANGE															
FLANGE	1/2"	16"	Flange,Blind,CL 600,RF,ASTM A182 F11 ,ASME B16.5,												
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F11 ,ASME B16.5,Same as pipe,												
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A182 F11 ,ASME B16.5,Same as pipe,												
BLIND															
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF),ASTM A387 GR.11 ,ASME B16.48,												
BLINDS	12"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A387 GR.11 ,ASME B16.48,												
GASKET															
GASKET	1/2"	16"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,												
BOLT & NUT															
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B16,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,CERAMIC COATED,												
VALVE															
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,Self Operated,PWHT,												
VALVE	2"	16"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT,												

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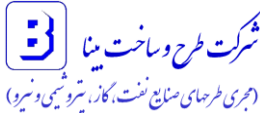
OWNER:  شرکت پتروشیمی پارس (سهامی عامی) Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	153 of 216

Piping Class:			MS-16												
Design Code:			ASME B31.3						Base Material:		AS (1 1/4Cr ½ Mo)				
Flange Rating & Facing:			600#		RF		Trim Material:		CN 5						
Corrosion Allowance:			1.5mm						PWHT:		Yes				
Service:			High-Pressure Steam, High-Pressure Steam Condensate, Boiler Feed Water												
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450
Design Pressure(Barg):			103.4	103.4	103.0	99.5	95.9	92.7	85.7	82.6	80.4	77.6	73.3	70.0	67.7
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT,												
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/FNPT, ASME B16.11,HO,PWHT,												
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HO,PWHT,												
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F11 ,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT,												
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HO,PWHT,												

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 154 of 216




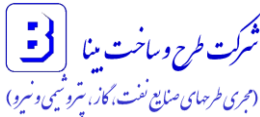
Piping Class:			OL-1																			
Design Code:			ASME B31.3										Base Material:					S.S 304H				
Flange Rating & Facing:			300#					RF					Trim Material:					CN 16				
Corrosion Allowance:			1.5mm										PWHT:					No				
Service:			Propane, H2, Isobutane, Propylene, Dry Gas																			
Design Temperature(C):			100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600	625	650	675
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3
PIPE																						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304H,ASME B36.19M,SCH 80S,																			
PIPE	2"	16"	Pipe,SMLS,BE,ASTM A312 TP304H,ASME B36.19M,SCH 40S,																			
PIPE	18"	18"	Pipe,SMLS,BE,ASTM A312 TP304H,ASME B36.10M,SCH 30,																			
PIPE	20"	20"	Pipe,SMLS,BE,ASTM A312 TP304H,ASME B36.10M,SCH XS,																			
PIPE	24"	24"	Pipe,SMLS,BE,ASTM A312 TP304H,ASME B36.10M,SCH 30,																			
PIPE	26"	30"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 17.48mm,																			
PIPE	32"	34"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 20.62 mm,																			
PIPE	36"	40"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 22.23 mm,																			
PIPE	42"	42"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 23.83 mm,																			
PIPE	44"	46"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 25.4 mm,																			
PIPE	48"	48"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 26.97 mm,																			
PIPE	50"	52"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 28.58 mm,																			
PIPE	54"	60"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304H CL1,ASME B36.10M,THK. 31.75 mm,																			
FITTING																						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	2"	16"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 40S,																			
FITTING	18"	18"	Elbow-45 LR,SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	20"	20"	Elbow-45 LR,SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH XS																			
FITTING	24"	24"	Elbow-45 LR,SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	26"	30"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 17.48 mm,																			
FITTING	32"	34"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 20.62 mm,																			
FITTING	36"	40"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,Mfr. Std.,THK. 22.23 mm,																			
FITTING	42"	42"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 23.83 mm,																			
FITTING	44"	46"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 25.4 mm,																			
FITTING	48"	48"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX, ASME B16.9.,THK. 26.97 mm,																			
FITTING	50"	52"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,Mfr. Std.,THK. 28.58 mm,																			
FITTING	54"	60"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,Mfr. Std.,THK. 31.75 mm,																			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			

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OWNER:  MC : 	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	155 of 216



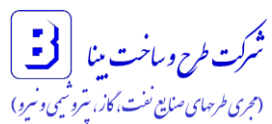

Piping Class:			OL-1																			
Design Code:			ASME B31.3										Base Material:				S.S 304H					
Flange Rating & Facing:			300#					RF					Trim Material:				CN 16					
Corrosion Allowance:			1.5mm										PWHT:				No					
Service:			Propane, H2, Isobutane, Propylene, Dry Gas																			
Design Temperature(C):			100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600	625	650	675
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	2"	16"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 40S,																			
FITTING	18"	18"	Elbow-90 LR,SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	20"	20"	Elbow-90 LR,SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH XS,																			
FITTING	24"	24"	Elbow-90 LR,SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	26"	30"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 17.48 mm,																			
FITTING	32"	34"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 20.62 mm,																			
FITTING	36"	40"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 22.23 mm,																			
FITTING	42"	42"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 23.83 mm,																			
FITTING	44"	46"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 25.4 mm,																			
FITTING	48"	48"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX, ASME B16.9.,THK. 26.97 mm,																			
FITTING	50"	52"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-S, Mfr. Std, THK. 28.58 mm,																			
FITTING	54"	60"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,Mfr. Std.,THK. 31.75 mm,																			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	2"	16"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 40S,																			
FITTING	18"	18"	Cap, SMLS.,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	20"	20"	Cap, SMLS.,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH XS,																			
FITTING	24"	24"	Cap, SMLS.,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	26"	30"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,THK. 17.48 mm,																			
FITTING	32"	34"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,THK. 20.62 mm,																			
FITTING	36"	40"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,THK. 22.23 mm,																			
FITTING	42"	42"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,THK. 23.83 mm,																			
FITTING	44"	46"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,THK. 25.4 mm,																			
FITTING	48"	48"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,THK. 26.97 mm,																			
FITTING	50"	52"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,Mfr. Std.,THK. 28.58 mm,																			
FITTING	54"	60"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,Mfr. Std.,THK. 31.75 mm,																			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 GR. F304H,MSS SP-97,Class 3000,																			
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 GR. F304H,MSS SP-97,Class 3000,																			

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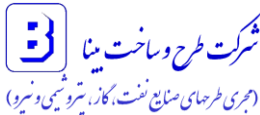

OWNER:  MC : 	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	156 of 216

Piping Class:			OL-1																			
Design Code:			ASME B31.3										Base Material:					S.S 304H				
Flange Rating & Facing:			300#					RF					Trim Material:					CN 16				
Corrosion Allowance:			1.5mm										PWHT:					No				
Service:			Propane, H2, Isobutane, Propylene, Dry Gas																			
Design Temperature(C):			100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600	625	650	675
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 GR. F304H,MSS SP-97,																			
FITTING	3"	16"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,																			
FITTING	18"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,																			
FITTING	26"	48"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,																			
FITTING	50"	60"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,Mfr. Std.,																			
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,																			
FITTING	26"	48"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,																			
FITTING	50"	60"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,Mfr. Std.,																			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc, SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304H-S,MSS SP-95,																			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 GR. F304H,MSS SP-83,Class 3000,																			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A312 TP304H,ASME B36.19M,Same as pipe,																			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A312 TP304H,ASME B36.19M,Same as pipe,																			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,POE/TOE,ASTM A312 TP304H,ASME B36.19M,Same as pipe,																			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																			
FITTING	2"	16"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 40S,																			
FITTING	18"	18"	Tee-Straight,SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	20"	20"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH XS,																			
FITTING	24"	24"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																			
FITTING	26"	30"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 17.48 mm,																			
FITTING	32"	34"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 20.62 mm,																			
FITTING	36"	40"	Tee-Straight. Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,THK. 22.23 mm.																			



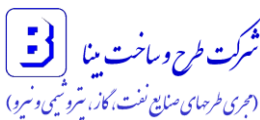

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OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی و طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	158 of 216

Piping Class:			OL-1																			
Design Code:			ASME B31.3										Base Material:				S.S 304H					
Flange Rating & Facing:			300#					RF					Trim Material:				CN 16					
Corrosion Allowance:			1.5mm										PWHT:				No					
Service:			Propane, H2, Isobutane, Propylene, Dry Gas																			
Design Temperature(C):			100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600	625	650	675
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304H,ASME B16.48,																			
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304H,ASME B16.48,																			
BLINDS	26"	60"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304H,as per project spec. 3981-00-BA-PI-SPC-022,/3981-00-BA-PI-DSH-056																			
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A240 GR.304H,ASME B16.48,																			
BLINDS	10"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304H,ASME B16.48,																			
BLINDS	26"	60"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304H,as per project spec. 3981-00-BA-PI-SPC-022,																			
GASKET																						
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																			
GASKET	26"	60"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,																			
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																			
GASKET	26"	60"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,																			
BOLT & NUT																						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8T CLASS 2,NUT:ASTM A194 GR.8T,ASME B1.1 ASME B18.2.1 ASME B18.2.2,																			
VALVE																						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN16 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 602,SW ASME B16.11,Self Operated,																			
VALVE	2"	2"	CHECK VALVE DUAL PLATE,CL 150,LUG TYPE, ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 594, ASME B16.5,Self Operated,																			
VALVE	2"	24"	CHECK VALVE B C SWING TYPE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,BS 1868,FLANGED ASME B16.5,Self Operated,																			
VALVE	26"	56"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A351 CF8 MIN.0.04%C,TRIM: CN12 (316+HF) (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 594, ASME B16.5,Self Operated,																			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr. 8T,API 602,SW ASME B16.11,HO,																			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 GR. F304H,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr. 8T,API 602,SW/FNPT, ASME B16.11,HO,																			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 600,FLANGED ASME B16.5,HO,																			
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 600,FLANGED ASME B16.5,GO,																			



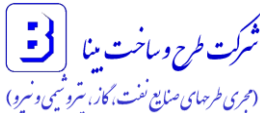

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت  شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	159 of 216

Piping Class:			OL-1																			
Design Code:			ASME B31.3										Base Material:					S.S 304H				
Flange Rating & Facing:			300#					RF					Trim Material:					CN 16				
Corrosion Allowance:			1.5mm										PWHT:					No				
Service:			Propane, H2, Isobutane, Propylene, Dry Gas																			
Design Temperature(C):			100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600	625	650	675
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3
VALVE	26"	36"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 600,FLANGED ASME B16.5,GO,																			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 602,SW ASME B16.11,HO,																			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,BS 1873,FLANGED ASME B16.5,HO,																			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,BS 1873,FLANGED ASME B16.5,GO,																			

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	160 of 216



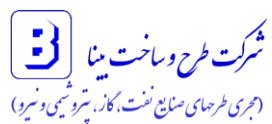

Piping Class:			OL-5			
Design Code:			ASME B31.3		Base Material	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			H2、Flare、Propane			
Design Temperature(C):			-150			
Design Pressure(Barg):			5.3			
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 40S,			
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 40S,			
PIPE	2 1/2"	20"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 10S,			
PIPE	22"	24"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M,LT System (Lateral Expansion at -196C),THK. 7.92mm.			
PIPE	28"	28"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304/304L CL1,ASME B36.10M,LT System (Lateral Expansion at -196C),SCH 10			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	2 1/2"	20"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 10S			
FITTING	22"	24"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), THK. 7.92mm,			
FITTING	28"	28"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 10,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	2 1/2"	20"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,			
FITTING	22"	24"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), THK. 7.92mm,			
FITTING	28"	28"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 10,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	2 1/2"	20"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,			
FITTING	22"	24"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), THK. 7.92mm			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت پارس (مهندسی و طراحی)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	161 of 216



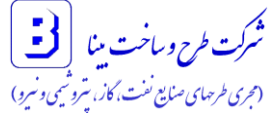

Piping Class:			OL-5			
Design Code:			ASME B31.3		Base Material	S.S 304/304L
Flange Rating & Facing:			150#	RF		Trim Material: CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			H2, Flare, Propane			
Design Temperature(C):			-150			
Design Pressure(Barg):			5.3			
FITTING	28"	28"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 10,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F304/304L,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F304,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F304/304L,MSS SP-97,LT System (Lateral Expansion at -196C),			
FITTING	2 1/2"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	28"	28"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	2 1/2"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	28"	28"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc SMLS,POE/TOE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F304/304L,MSS SP-83,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length: 100mmSMLS,PBE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length: 100mmSMLS,TBE(NPT-M),ASTM A312 TP304,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length: 100mmSMLS,POE/TOE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	2 1/2"	20"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	162 of 216



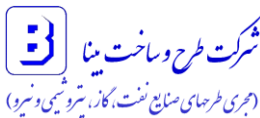

Piping Class:			OL-5			
Design Code:			ASME B31.3		Base Material	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			H2、 Flare、 Propane			
Design Temperature(C):			-150			
Design Pressure(Barg):			5.3			
FITTING	22"	24"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), THK. 7.92mm,			
FITTING	28"	28"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 10,			
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	2 1/2"	20"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 10S,			
FITTING	22"	24"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), THK. 7.92mm,			
FITTING	28"	28"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 10,			
FLANGE						
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM A182 F304,ASME B16.5,LT System (Lateral Expansion at -196C),			
FLANGE	28"	28"	Flange,Blind,CL 150,RF,ASTM A182 F304,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),			
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A182 F304,ASME B16.5,LT System (Lateral Expansion at -196C),			
FLANGE	28"	28"	Flange,Blind,CL 300,RF,ASTM A182 F304,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	28"	28"	Flange,WN,CL 150,RF,ASTM A182 F304/304L,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	28"	28"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),Same as pipe,			
BLIND						
BLINDS	1/2"	14"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			
BLINDS	16"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			
BLINDS	28"	28"	Blanks and Spacers,CL 150,RF (RF),ASTM A240 GR.304,as per project spec. 3981-00-BA-PI-SPC-022,LT System (Lateral Expansion at -196C),			
BLINDS	1/2"	14"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			
BLINDS	16"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			
BLINDS	28"	28"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304,as per project spec. 3981-00-BA-PI-SPC-022,LT System (Lateral Expansion at -196C),			
GASKET						

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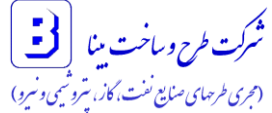

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	163 of 216

Piping Class:			OL-5			
Design Code:			ASME B31.3		Base Material	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			H2, Flare, Propane			
Design Temperature(C):			-150			
Design Pressure(Barg):			5.3			
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.5,4.5 mm,			
GASKET	28"	28"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.47 SERIES B,4.5 mm,			
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.5,4.5 mm,			
GASKET	28"	28"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.47 SERIES B,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A320 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F304,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS EN ISO 17292,FLANGED ASME B16.5,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 608,FLANGED ASME B16.5,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	6"	24"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 6D,FLANGED ASME B16.5,GO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,Self Operated,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,GO,Cryogenic Services, LT System (Lateral Expansion at -196C),			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 	
MC : 	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	164 of 216



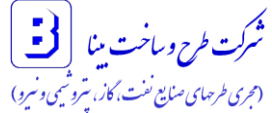

Piping Class:			OL-5			
Design Code:			ASME B31.3		Base Material	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			H2, Flare, Propane			
Design Temperature(C):			-150			
Design Pressure(Barg):			5.3			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,GO,Cryogenic Services, LT System (Lateral Expansion at -196C),			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	165 of 216

Piping Class:	OL-6			
Design Code:	ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:	300#	RF	Trim Material:	CN 12
Corrosion Allowance:	1.5mm		PWHT:	No
Service:	Methane, Ethane, Propane, Dry Flare Gas, Ethylene			
Design Temperature(C):	-196 to 38	50	100	150
Design Pressure(Barg):	49.6	47.8	40.9	37.0



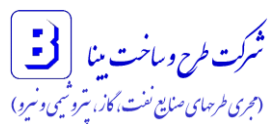

PIPE			
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 80S,
PIPE	2"	2 1/2"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 80S,
PIPE	3"	6"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 40S,
PIPE	8"	12"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M,LT System (Lateral Expansion at -196C), SCH 30,
PIPE	14"	16"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M,LT System (Lateral Expansion at -196C), SCH STD,
PIPE	18"	18"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M,LT System (Lateral Expansion at -196C), SCH 30,
PIPE	20"	30"	Pipe,EFW Long. Seam 100%RT,BE,ASTM A358 GR.304/304L CL1,ASME B36.10M,LT System (Lateral Expansion at -196C),SCH XS,
FITTING			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,
FITTING	2"	2 1/2"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,
FITTING	3"	6"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,
FITTING	8"	12"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 30,
FITTING	14"	16"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), SCH STD,
FITTING	18"	18"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C), SCH 30,
FITTING	20"	30"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C), SCH XS,
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,
FITTING	2"	2 1/2"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,
FITTING	3"	6"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,
FITTING	8"	12"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,
FITTING	14"	16"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,
FITTING	18"	18"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,
FITTING	20"	30"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 166 of 216

Piping Class:			OL-6			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			300#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Methane, Ethane, Propane, Dry Flare Gas, Ethylene			
Design Temperature(C):			-196 to 38	50	100	150
Design Pressure(Barg):			49.6	47.8	40.9	37.0
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2 1/2"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,			
FITTING	3"	6"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	8"	12"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,			
FITTING	14"	16"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,			
FITTING	18"	18"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,			
FITTING	20"	30"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F304/304L,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 F304,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F304/304L,MSS SP-97,LT System (Lateral Expansion at -196C),			
FITTING	3"	18"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	20"	30"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	3"	18"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	20"	30"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End, MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End, MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F304/304L,MSS SP-83,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A312 TP304,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,			

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OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	167 of 216



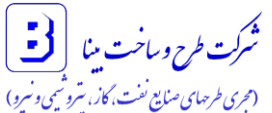

Piping Class:			OL-6			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			300#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Methane、 Ethane、 Propane 、 Dry Flare Gas、 Ethylene			
Design Temperature(C):			-196 to 38	50	100	150
Design Pressure(Barg):			49.6	47.8	40.9	37.0
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2 1/2"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,			
FITTING	3"	6"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	8"	12"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,			
FITTING	14"	16"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,			
FITTING	18"	18"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,			
FITTING	20"	30"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,			
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	2 1/2"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 80S,			
FITTING	3"	6"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	8"	12"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,			
FITTING	14"	16"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH STD,			
FITTING	18"	18"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 30,			
FITTING	20"	30"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP304/304L-WX,ASME B16.9,LT System (Lateral Expansion at -196C),SCH XS,			
FLANGE						
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A182 F304,ASME B16.5,LT System (Lateral Expansion at -196C),			
FLANGE	26"	30"	Flange,Blind,CL 300,RF,ASTM A182 F304,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),			
FLANGE	1/2"	24"	Flange,Blind,CL 600,RF,ASTM A182 F304,ASME B16.5,LT System (Lateral Expansion at -196C),			
FLANGE	26"	30"	Flange,Blind,CL 600,RF,ASTM A182 F304,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	26"	30"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,			
FLANGE	26"	30"	Flange,WN,CL 600,RF,ASTM A182 F304/304L,ASME B16.47 Serial B,LT System (Lateral Expansion at -196C),Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			

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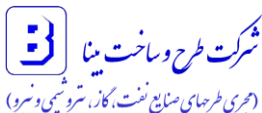

OWNER: <div></div>	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT: <div></div> <div></div>	
	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : <div></div>	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	168 of 216

Piping Class:			OL-6			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			300#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Methane, Ethane, Propane , Dry Flare Gas, Ethylene			
Design Temperature(C):			-196 to 38	50	100	150
Design Pressure(Barg):			49.6	47.8	40.9	37.0
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			
BLINDS	26"	28"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304,as per project spec. 3981-00-BA-PI-SPC-022,LT System (Lateral Expansion at -196C),			
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			
BLINDS	10"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304,ASME B16.48,LT System (Lateral Expansion at -196C),			
BLINDS	26"	30"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304,as per project spec. 3981-00-BA-PI-SPC-022,LT System (Lateral Expansion at -196C),			
GASKET						
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.5,4.5 mm,			
GASKET	26"	30"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.47 SERIES B,4.5 mm,			
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.5,4.5 mm,			
GASKET	26"	30"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.47 SERIES B,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A320 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 300,FLANGED, RF,ASTM A182 F304,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS EN ISO 17292,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C),MFR			
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 300,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 608,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C),MFR			
VALVE	6"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 300,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 6D,FLANGED ASME B16.5,GO,LT System (Lateral Expansion at -196C),MFR			
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,Self Operated,LT System (Lateral Expansion at -196C),			
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,LT System (Lateral Expansion at -196C),			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C),			

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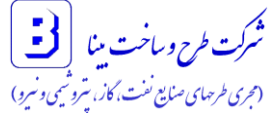

OWNER:  Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 	
MC : 	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	169 of 216

Piping Class:			OL-6			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			300#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Methane、 Ethane、 Propane 、 Dry Flare Gas、 Ethylene			
Design Temperature(C):			-196 to 38	50	100	150
Design Pressure(Barg):			49.6	47.8	40.9	37.0
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,GO,LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,LT System (Lateral Expansion at -196C),			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C),			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,GO,LT System (Lateral Expansion at -196C),			

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	170 of 216



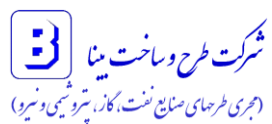

Piping Class:			OL-7			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			600#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Propane, Isobutane, Isobutene, Propylene			
Design Temperature(C):			-196 to 38	50	100	150
Design Pressure(Barg):			99.3	95.6	81.7	74.0
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 80S,			
PIPE	2"	10"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	10"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	10"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	10"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F304/304L,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F304,MSS SP-97,LT System (Lateral Expansion at -196C),Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F304/304L,MSS SP-97,LT System (Lateral Expansion at -196C),			
FITTING	3"	10"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	3"	10"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),			

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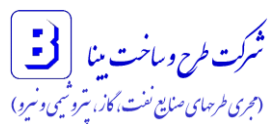

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification							CONTRACTOR/CONSULTANT:  	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 171 of 216

Piping Class:			OL-7				
Design Code:			ASME B31.3		Base Material:		S.S 304/304L
Flange Rating & Facing:			600#	RF		Trim Material:	CN 12
Corrosion Allowance:			1.5mm			PWHT:	No
Service:			Propane, Isobutane, Isobutene, Propylene				
Design Temperature(C):			-196 to 38	50		100	150
Design Pressure(Barg):			99.3	95.6		81.7	74.0
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,LT System (Lateral Expansion at -196C),				
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,				
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,				
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F304/304L,MSS SP-83,LT System (Lateral Expansion at -196C),Class 3000,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A312 TP304/304L,ASME B36.19M,LT System (Lateral Expansion at -196C),Same as pipe,				
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,				
FITTING	2"	10"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,				
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F304/304L,ASME B16.11,LT System (Lateral Expansion at -196C),Class 3000,				
FITTING	2"	10"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,LT System (Lateral Expansion at -196C),SCH 40S,				
FLANGE							
FLANGE	1/2"	10"	Flange,Blind,CL 600,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),				
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,				
FLANGE	2"	10"	Flange,WN,CL 600,RF,ASTM A182 F304/304L,ASME B16.5,LT System (Lateral Expansion at -196C),Same as pipe,				
BLIND							
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A240 GR.304/304L,ASME B16.48,LT System (Lateral Expansion at -196C),				
BLINDS	10"	10"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304/304L,ASME B16.48,LT System (Lateral Expansion at -196C),				
GASKET							
GASKET	1/2"	10"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,LT System (Lateral Expansion at -196C),ASME B16.5,4.5 mm,				
BOLT & NUT							
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A320 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,				
VALVE							
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 600,FLANGED, RF,ASTM A182 F304,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS EN ISO 17292,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C),				
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 600,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 608,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C).				

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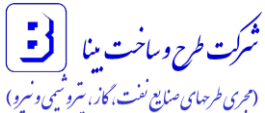

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	172 of 216

Piping Class:			OL-7			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			600#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Propane, Isobutane, Isobutene, Propylene			
Design Temperature(C):			-196 to 38	50	100	150
Design Pressure(Barg):			99.3	95.6	81.7	74.0
VALVE	6"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 600,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+KELF,SEAL: RPTFE + ELGILOY,MNFR,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 6D,FLANGED ASME B16.5,GO,LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,Self Operated,LT System (Lateral Expansion at -196C),			
VALVE	2"	10"	CHECK VALVE BC SWING TYPE,CL 600,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1868,FLANGED ASME B16.5,Self Operated,LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW/FNPT, ASME B16.11,HO,LT System (Lateral Expansion at -196C),			
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 600,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 600,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C),			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F304,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 602,SW ASME B16.11,HO,LT System (Lateral Expansion at -196C),			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,HO,LT System (Lateral Expansion at -196C),			
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 600,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A320 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS 1873,FLANGED ASME B16.5,GO,LT System (Lateral Expansion at -196C),			

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی و ساخت، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	173 of 216



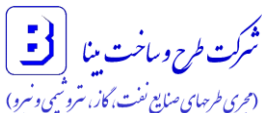

Piping Class:			PR-1																
Design Code:			ASME B31.3								Base Material:				AS (1 1/4Cr ½ Mo)				
Flange Rating & Facing:			300#				RF				Trim Material:				CN 5				
Corrosion Allowance:			1.5 mm								PWHT:				Yes				
Service:			Cat, Regeneration Gas																
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538	550
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2	33.7	31.7	25.7	14.9	12.7
PIPE																			
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A335 P11,ASME B36.10M,SCH 160,																
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M,SCH 160,																
PIPE	2 1/2"	8"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M,SCH XS,																
PIPE	10"	10"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M,SCH 80,																
FITTING																			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,																
FITTING	2 1/2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,																
FITTING	10"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,																
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,																
FITTING	2 1/2"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9, SCH XS,																
FITTING	10"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,																
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,																
FITTING	2 1/2"	8"	Cap, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,																
FITTING	10"	10"	Cap, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,																
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F11 CL2,MSS SP-97,Class 3000,																
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 F11 CL2,MSS SP-97,Class 3000,																
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F11 CL2,MSS SP-97,																
FITTING	3"	10"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,																
FITTING	3"	10"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,																
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 CL2,MSS SP-95,																
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 GR.WP11 CL2,MSS SP-95,																
FITTING	3/4"	1 1/2"	Swage Nipple-Conc.. SMLS,POE/TOE,ASTM A234 GR.WP11 CL2,MSS SP-95,																

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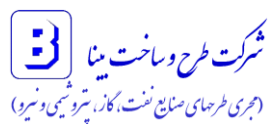

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	174 of 216

Piping Class:			PR-1																
Design Code:			ASME B31.3								Base Material:				AS (1 1/4Cr ½ Mo)				
Flange Rating & Facing:			300#				RF				Trim Material:				CN 5				
Corrosion Allowance:			1.5 mm								PWHT:				Yes				
Service:			Cat、Regeneration Gas																
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538	550
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2	33.7	31.7	25.7	14.9	12.7
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 CL2,MSS SP-95,																
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 CL2,MSS SP-95,																
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 GR.WP11 CL2,MSS SP-95,																
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 GR.WP11 CL2,MSS SP-95,																
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 CL2,MSS SP-95,																
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F11 CL2,MSS SP-83,Class 3000,																
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A335 P11,ASME B36.10M,Same as pipe,																
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A335 P11,ASME B36.10M,Same as pipe,																
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A335 P11,ASME B36.10M,Same as pipe,																
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,																
FITTING	2 1/2"	8"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,																
FITTING	10"	10"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,																
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,																
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,																
FITTING	2 1/2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,																
FITTING	10"	10"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,																
FLANGE																			
FLANGE	1/2"	10"	Flange,Blind,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,																
FLANGE	1/2"	10"	Flange,Blind,CL 600,RF,ASTM A182 F11 CL2,ASME B16.5,																
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,																
FLANGE	2"	10"	Flange,WN,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,																
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,																
FLANGE	2"	10"	Flange,WN,CL 600,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,																
BLIND																			
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A387 GR.11 CL2,ASME B16.48,																
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF),ASTM A387 GR.11 CL2,ASME B16.48,																

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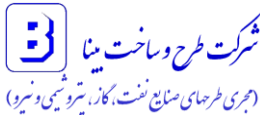

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
MC :  APG	Piping Material Specification							
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	175 of 216

Piping Class:			PR-1																
Design Code:			ASME B31.3								Base Material:				AS (1 1/4Cr ½ Mo)				
Flange Rating & Facing:			300#				RF				Trim Material:				CN 5				
Corrosion Allowance:			1.5 mm								PWHT:				Yes				
Service:			Cat, Regeneration Gas																
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538	550
Design Pressure(Barg):			51.7	51.7	51.5	49.7	48.0	46.3	42.9	41.4	40.3	38.9	36.5	35.2	33.7	31.7	25.7	14.9	12.7
GASKET																			
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																
GASKET	1/2"	10"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																
BOLT & NUT																			
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B16,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,CERAMIC COATED,																
VALVE																			
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,Self Operated,PWHT,																
VALVE	2"	10"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,PWHT,																
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT,																
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/FNPT, ASME B16.11,HO,PWHT,																
VALVE	2"	10 "	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HO,PWHT,																
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,PWHT,																
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HO,PWHT,																

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	176 of 216

PIPING CLASS:		PR-3									
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel			
Flange Rating & Facing:		150#				RF		Trim Material:			
Corrosion Allowance:		Note1				PWHT:			No		
Service:		Catalyst									
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300	325	350	370
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4	7.6
PIPE											
PIPE	1/2"	8"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH XS,								
PIPE	10"	10"	Pipe,SMLS,BE,ASTM A106 GR.B,ASME B36.10M,SCH 80,								
FITTING											
FITTING	1/2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,								
FITTING	10"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,								
FITTING	1/2"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,								
FITTING	10"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,								
FITTING	1/2"	8"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,								
FITTING	10"	10"	Cap, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,								
FITTING	1/2"	8"	Olet-Weldolet,Forged,BW,ASTM A105,MSS SP-97,								
FITTING	1/2"	10"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,								
FITTING	1/2"	10"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 WPB,ASME B16.9,								
FITTING	3/4"	4"	Swage Nipple-Conc., SMLS,BBE (Applicable for Swage),ASTM A234 WPB,MSS SP-95,								
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,BBE,ASTM A106 GR.B,ASME B36.10M,Same as pipe,								
FITTING	1/2"	8"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,								
FITTING	10"	10"	Tee-Straight, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,								
FITTING	1/2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH XS,								
FITTING	10"	10"	Tee-Reducing, SMLS,BW,ASTM A234 WPB,ASME B16.9,SCH 80,								
FLANGE											
FLANGE	1/2"	10"	Flange, Blind,CL 150,RF,ASTM A105,ASME B16.5,								
FLANGE	1/2"	10"	Flange,Blind,CL 300,RF,ASTM A105,ASME B16.47 Serial B,								
FLANGE	1/2"	10"	Flange,WN,CL 150,RF,ASTM A105,ASME B16.5,Same as pipe,								
FLANGE	1/2"	10"	Flange,WN,CL 300,RF,ASTM A105,ASME B16.5,Same as pipe,								
BLIND											
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A515 GR.70,ASME B16.48,								
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A515 GR.70,ASME B16.48,								
GASKET											
GASKET	1/2"	10"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,								



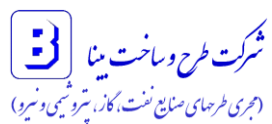

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی و ساخت پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	177 of 216

PIPING CLASS:		PR-3									
Design Code:		ASME B31.3				Base Material:		Killed Carbon Steel			
Flange Rating & Facing:		150#				RF		Trim Material:			
Corrosion Allowance:		Note1				PWHT:			No		
Service:		Catalyst									
Design Temperature(°C):		-29 to 38	50	100	150	200	250	300	325	350	370
Design Pressure(Barg):		19.6	19.2	17.7	15.8	13.8	12.1	10.2	9.3	8.4	7.6
BOLT & NUT											
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B7,NUT:ASTM A194 GR.2H,ASME B1.1 ASME B18.2.1 ASME B18.2.2,Zinc plating with Chromate Coated,								
VALVE											
VALVE	1"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A105,STEM & BALL: 316, SEAT: 316+RPTFE,BODY SEAL:S.S 316 WITH FLEXIBLE GRAPHITE ,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,BS EN ISO 17292,FLANGED ASME B16.5,HO,								
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,FULL-PORT,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE, BODY SEAL:S.S 316 WITH FLEXIBLE GRAPHITE,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 608,FLANGED ASME B16.5,HO,								
VALVE	6"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED, FULL-PORT,CL 150,FLANGED, RF,ASTM A216 WCB,STEM & BALL: 316, SEAT: 316+RPTFE, BODY SEAL:S.S 316 WITH FLEXIBLE GRAPHITE,ASTM A193 Gr.B7 / ASTM A194 Gr.2H,API 6D,FLANGED ASME B16.5,GO,								



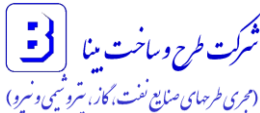

Note 1:

Piping schedules indicated herein include corrosion and erosion allowances due to the process catalyst flow.

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	178 of 216



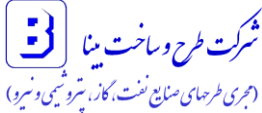

Piping Class:			PR-36			
Design Code:			ASME B31.3		Base Material:	S.S 316H
Flange Rating & Facing:			300#	RF	Trim Material	CN 16
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Instrument Air, Chlorine Gas			
Design Temperature(C):			640			
Design Pressure(Barg):			3			
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP316H,ASME B36.19M,SCH 80S,			
PIPE	2"	6"	Pipe,SMLS,BE,ASTM A312 TP316H,ASME B36.19M,SCH 40S,			
PIPE	8"	16"	Pipe, SMLS,BE,ASTM A312 TP316H,ASME B36.19M,SCH 40S,			
PIPE	18"	24"	Pipe, SMLS,BE, ASTM A312 TP316H,ASME B36.10M,SCH XS,			
PIPE	26"	28"	Pipe, EFW Long. Seam 100%RT,BE,ASTM A358 GR.316H CL1,ASME B36.10M,SCH XS,			
PIPE	30"	32"	Pipe, EFW Long. Seam 100%RT,BE,ASTM A358 GR.316H CL1,ASME B36.10M,SCH STD,			
PIPE	40"	42"	Pipe, EFW Long. Seam 100%RT,BE,ASTM A358 GR.316H CL1,ASME B36.10M,THK. 14.27 mm,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			
FITTING	8"	16"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			
FITTING	18"	24"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH XS,			
FITTING	26"	28"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9, SCH XS,			
FITTING	30"	32"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9, SCH STD,			
FITTING	40"	42"	Elbow-45 LR, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9, THK. 14.27 mm,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			
FITTING	8"	16"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			
FITTING	18"	24"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH XS,			
FITTING	26"	28"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9, SCH XS,			
FITTING	30"	32"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9, SCH STD,			
FITTING	40"	42"	Elbow-90 LR, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9, THK. 14.27 mm,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	2"	6"	Cap, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			
FITTING	8"	16"	Cap. SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	179 of 216



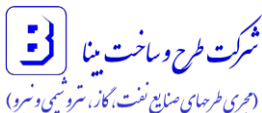

Piping Class:			PR-36			
Design Code:			ASME B31.3		Base Material:	S.S 316H
Flange Rating & Facing:			300#	RF	Trim Material	CN 16
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Instrument Air, Chlorine Gas			
Design Temperature(C):			640			
Design Pressure(Barg):			3			
FITTING	18"	28"	Cap, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH XS,			
FITTING	30"	32"	Cap, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH STD,			
FITTING	40"	42"	Cap, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,THK. 14.27 mm,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F316H,MSS SP-97,Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 F316H,MSS SP-97,Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F316H,MSS SP-97,			
FITTING	3"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,			
FITTING	26"	42"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9,SCH SAME AS PIPE,			
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,			
FITTING	26"	42"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9,SCH SAME AS PIPE,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP316H-S,MSS SP-95,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F316H,MSS SP-83,Class 3000,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,PBE,ASTM A312 TP316H,ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,TBE(NPT-M),ASTM A312 TP316H,ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mm,SMLS,POE/TOE,ASTM A312 TP316H,ASME B36.19M,Same as pipe,			
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			
FITTING	8"	16"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH 40S,			
FITTING	18"	24"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP316H-S,ASME B16.9,SCH XS,			
FITTING	26"	28"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9,SCH XS,			

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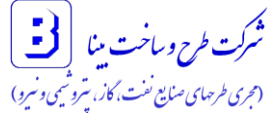

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	PROPANE DEHYDROGENATION (PDH) PROJECT							
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	180 of 216

Piping Class:			PR-36			
Design Code:			ASME B31.3		Base Material:	S.S 316H
Flange Rating & Facing:			300#	RF	Trim Material	CN 16
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Instrument Air, Chlorine Gas			
Design Temperature(C):			640			
Design Pressure(Barg):			3			
FITTING	30"	32"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9,SCH STD,			
FITTING	40"	42"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP316H-WX,ASME B16.9,14.27 mm,			
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F316H,ASME B16.11,Class 3000,			
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM A403 GR. WP316H-S,ASME B16.9,SCH 40S,			
FITTING	8"	16"	Tee-Reducing, SMLS,BW,ASTM A403 GR. WP316H-S,ASME B16.9,SCH 40S,			
FITTING	18"	24"	Tee-Reducing, SMLS,BW,ASTM A403 GR. WP316H-S,ASME B16.9,SCH XS,			
FITTING	26"	28"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR. WP316H-WX,ASME B16.9,SCH XS,			
FITTING	30"	32"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR. WP316H-WX,ASME B16.9,SCH STD,			
FITTING	40"	42"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR. WP316H-WX,ASME B16.9,THK. 14.27 mm,			
FLANGE						
FLANGE	1/2"	20"	Flange,Blind,CL 300,RF,ASTM A182 F316H,ASME B16.5,			
FLANGE	1/2"	20"	Flange,Blind,CL 600,RF,ASTM A182 F316H,ASME B16.5,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F316H,ASME B16.5,Same as pipe,			
FLANGE	2"	20"	Flange,WN,CL 300,RF,ASTM A182 F316H,ASME B16.5,Same as pipe,			
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 F316H,ASME B16.5,Same as pipe,			
FLANGE	2"	20"	Flange,WN,CL 600,RF,ASTM A182 F316H,ASME B16.5,Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.316H,ASME B16.48,			
BLINDS	12"	20"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.316H,ASME B16.48,			
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF),ASTM A240 GR.316H,ASME B16.48,			
BLINDS	12"	20"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.316H,ASME B16.48,			
GASKET						
GASKET	1/2"	20"	SPWgasket,CL 300,For Use With RF Flange, 316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316, /CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
GASKET	1/2"	20"	SPWgasket,CL 600,For Use With RF Flange, 316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 Gr.B8T CLASS 2,NUT:ASTM A194 Gr.8T,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F316H,TRIM: CN16 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,API 602,SW ASME B16.11,Self Operated,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	181 of 216

Piping Class:			PR-36			
Design Code:			ASME B31.3		Base Material:	S.S 316H
Flange Rating & Facing:			300#	RF	Trim Material	CN 16
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Instrument Air, Chlorine Gas			
Design Temperature(C):			640			
Design Pressure(Barg):			3			
VALVE	2"	12"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A351 CF8M MIN.0.04%C,TRIM: CN16 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,BS 1868,FLANGED ASME B16.5,Self Operated,			
VALVE	14"	20"	CHECK VALVE DUAL PLATE,CL 300,FLANGED, RF,ASTM A351 CF8M MIN.0.04%C,TRIM: CN16 (AS PER API 600),Spring: Inconel X750,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,BS 1868,FLANGED ASME B16.5,Self Operated,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F316H,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,API 602,SW ASME B16.11,HO,			
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F316H,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,API 602,SW/FNPT, ASME B16.11,HO,			
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8M MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,API 600,FLANGED ASME B16.5,HO,			
VALVE	14"	20"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8M MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,API 600,FLANGED ASME B16.5,GO,			
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F316H,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,API 602,SW ASME B16.11,HO,			
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8M MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,BS 1873,FLANGED ASME B16.5,HO,			
VALVE	8"	14"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8M MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8T CLASS 2/ ASTM A194 Gr.8T,BS 1873,FLANGED ASME B16.5,GO,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	182 of 216



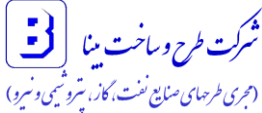

Piping Class:			OR-1																		
Design Code:			B31.3									Base Material:				S.S 304H					
Flange Rating & Facing:			300#				RF					Trim Material:				CN 16					
Corrosion Allowance:			1.5mm									PWHT:				No					
Service:			H2、 Cat																		
Design Temperature(C):			100	150	200	250	300	350	400	425	450	475	500	538	550	575	600	625	650	675	
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	29.6	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3	
PIPE																					
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304H,ASME B36.19M,SCH 160S,																		
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A312 TP304H,ASME B36.19M,SCH 160S,																		
PIPE	2 1/2"	10"	Pipe,SMLS,BE,ASTM A312 TP304H,ASME B36.19M,SCH 80S,																		
FITTING																					
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9, SCH 160S,																		
FITTING	2 1/2"	10"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 80S,																		
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 160S,																		
FITTING	2 1/2"	10"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 80S,																		
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	2"	2"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 160S,																		
FITTING	2 1/2"	10"	Cap, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 80S																		
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 GR. F304H,MSS SP-97,Class 3000,																		
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 GR. F304H,MSS SP-97,Class 3000,																		
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 GR. F304H,MSS SP-97,																		
FITTING	3"	10"	Reducer-Conc. Reducer, SMLS,B W,ASTM A403 GR.WP304H-S,ASME B16.9,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304H-S,MSS SP-95.																		

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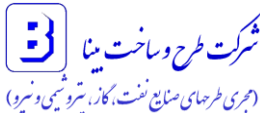

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	183 of 216

Piping Class:			OR-1																		
Design Code:			B31.3									Base Material:				S.S 304H					
Flange Rating & Facing:			300#				RF					Trim Material:				CN 16					
Corrosion Allowance:			1.5mm									PWHT:				No					
Service:			H2、 Cat																		
Design Temperature(C):			100	150	200	250	300	350	400	425	450	475	500	538	550	575	600	625	650	675	
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	29.6	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3	
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 GR. F304H,MSS SP-83,Class 3000,																		
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A312 TP304H,ASME B36.19M,Same as pipe,																		
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A312 TP304H,ASME B36.19M,Same as pipe,																		
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A312 TP304H,ASME B36.19M,Same as pipe,																		
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 160S,																		
FITTING	2 1/2"	10"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 80S,																		
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 160S,																		
FITTING	2 1/2"	10"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 80S,																		
FLANGE																					
FLANGE	1/2"	10"	Flange,Blind,CL 300,RF,ASTM A182 GR. F304H,ASME B16.5,																		
FLANGE	1/2"	10"	Flange,Blind,CL 600,RF,ASTM A182 GR. F304H,ASME B16.5,																		
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
FLANGE	2"	10"	Flange,WN,CL 300,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
FLANGE	2"	10"	Flange,WN,CL 600,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
BLIND																					
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304H,ASME B16.48,																		
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A240 GR.304H,ASME B16.48,																		
BLINDS	10"	10"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304H,ASME B16.48,																		
GASKET																					
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																		
GASKET	1/2"	10"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																		
BOLT & NUT																					
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8T CLASS 2,NUT:ASTM A194 GR.8T,ASME B1.1 ASME B18.2.1 ASME B18.2.2,																		
VALVE																					

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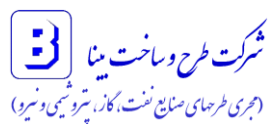

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	184 of 216

Piping Class:			OR-1																		
Design Code:			B31.3									Base Material:					S.S 304H				
Flange Rating & Facing:			300#			RF			Trim Material:					CN 16							
Corrosion Allowance:			1.5mm									PWHT:					No				
Service:			H2、 Cat																		
Design Temperature(C):			100	150	200	250	300	350	400	425	450	475	500	538	550	575	600	625	650	675	
Design Pressure(Barg):			40.9	37.0	34.5	32.5	30.9	29.6	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9	13.8	11.3	9.3	
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN16 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 602,SW ASME B16.11,Self Operated,																		
VALVE	2"	10"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8T / ASTM A194 Gr.8T,BS 1868,FLANGED ASME B16.5,Self Operated,																		
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN16(AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 602,SW ASME B16.11,HO,																		
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 GR. F304H,TRIM: CN16(AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 602,SW/FNPT, ASME B16.11,HO,																		
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 600,FLANGED ASME B16.5,HO,																		
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8T / ASTM A194 Gr.8T,API 602,SW ASME B16.11,HO,																		
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8T / ASTM A194 Gr.8T,BS 1873,FLANGED ASME B16.5,HO,																		
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN16 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8T / ASTM A194 Gr.8T,BS 1873,FLANGED ASME B16.5,GO,																		

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	185 of 216



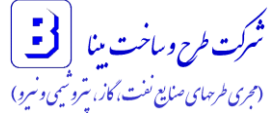

Piping Class:			OR-2						
Design Code:			ASME B31.3			Base Material		S.S 304/304L	
Flange Rating & Facing:			150#		RF		Trim Material:		CN 12
Corrosion Allowance:			2.5mm			PWHT:		No	
Service:			N2、 H2、 Cat						
Design Temperature(C):			-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):			19.0	18.3	15.7	14.2	13.2	12.1	10.2
PIPE									
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP304/304L,ASME B36.10M, SCH 160,						
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M,SCH 160,						
PIPE	2 1/2"	8"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M,SCH XS,						
PIPE	10"	10"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.10M, SCH 80,						
FITTING									
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11 ,Class 3000,						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11, Class 3000,						
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 160,						
FITTING	2 1/2"	8"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH XS,						
FITTING	10"	10"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11 ,Class 3000,						
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,						
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 160,						
FITTING	2 1/2"	8"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH XS,						
FITTING	10"	10"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 80,						
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F304,ASME B16.11,Class 3000,						
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,						
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11,Class 3000,						
FITTING	2"	2"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160,						
FITTING	2 1/2"	8"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH XS,						
FITTING	10"	10"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9 , SCH 80,						
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F304/304L,MSS SP-97,Class 3000,						
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F304,MSS SP-97 ,Class 3000,						
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F304/304L,MSS SP-97,						
FITTING	2 1/2"	10"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,						
FITTING	2 1/2"	10"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,						
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,						
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,						
FITTING	3/4"	1 1/2"	Swage Nipple-Conc SMLS,POE/TOE,ASTM A403 GR.WP304/304L-S,MSS SP-95,						

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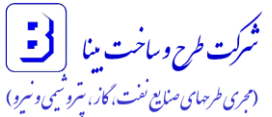

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت یانا (مهندسی و معماری)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	186 of 216

Piping Class:			OR-2													
Design Code:			ASME B31.3			Base Material		S.S 304/304L								
Flange Rating & Facing:			150#		RF		Trim Material:		CN 12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			N2, H2, Cat													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.0		18.3		15.7		14.2		13.2		12.1		10.2	
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,													
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304/304L-S,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,													
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304/304L-S,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304/304L-S,MSS SP-95,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F304/304L,ASME B16.11, Class 3000,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F304,ASME B16.11, Class 3000,													
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F304/304L,MSS SP-83, Class 3000,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A312 TP304/304L,ASME B36.10M ,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A312 TP304,ASME B36.10M,LT System (Lateral Expansion at -196C),Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A312 TP304/304L,ASME B36.10M, Same as pipe,													
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F304/304L,ASME B16.11 ,Class 3000,													
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9 ,SCH 160,													
FITTING	2 1/2"	8"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH XS,													
FITTING	10"	10"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80,													
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F304/304L,ASME B16.11 ,Class 3000,													
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 160,													
FITTING	2 1/2"	8"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH XS,													
FITTING	10"	10"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 80,													
FLANGE																
FLANGE	1/2"	10"	Flange,Blind,CL 150,RF,ASTM A182 F304,ASME B16.5,													
FLANGE	1/2"	10"	Flange,Blind,CL 300,RF,ASTM A182 F304,ASME B16.5,													
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,													
FLANGE	2"	10"	Flange,WN,CL 150,RF,ASTM A182 F304/304L,ASME B16.5, Same as pipe,													
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,													
FLANGE	2"	10"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.5, Same as pipe,													
BLIND																
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,													
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,													

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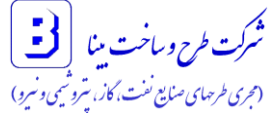

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	187 of 216

Piping Class:			OR-2													
Design Code:			ASME B31.3			Base Material		S.S 304/304L								
Flange Rating & Facing:			150#		RF		Trim Material:		CN 12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			N2, H2, Cat													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.0		18.3		15.7		14.2		13.2		12.1		10.2	
GASKET																
GASKET			1/2"		10"		SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20, ASME B16.5,4.5 mm,									
GASKET			1/2"		10"		SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20, ASME B16.5,4.5 mm,									
BOLT & NUT																
STUD BOLT & NUT			-		-		Full Threaded Stud Bolt / 2 Heavy Hex Nuts, BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,									
VALVE																
VALVE			1/2"		1 1/2"		BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F304,STEM & BALL: 316, SEAT: RPTFE,SEAL: GRAPHITE,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,BS EN ISO 17292,FLANGED ASME B16.5,HO,FIRE TEST AS PER API 607									
VALVE			2"		4"		BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: RPTFE,SEAL: GRAPHITE,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 608,FLANGED ASME B16.5,HO,FIRE TEST AS PER API 607									
VALVE			6"		10"		BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: RPTFE,SEAL: GRAPHITE,ASTM A193 Gr.B8MCLASS 2/ ASTM A194 Gr.8MA,API 6D,FLANGED ASME B16.5,GO,FIRE TEST AS PER API 607									
VALVE			1/2"		1 1/2"		CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 602,SW ASME B16.11,Self Operated									
VALVE			2"		10"		CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,BS 1868,FLANGED ASME B16.5,Self Operated,									
VALVE			1/2"		1 1/2"		GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),									
VALVE			1/2"		1 1/2"		GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 602,SW/FNPT, ASME B16.11,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),									
VALVE			2"		10"		GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 600,FLANGED ASME B16.5,HO,									
VALVE			1/2"		1 1/2"		GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,Cryogenic Services, LT System (Lateral Expansion at -196C),									
VALVE			2"		6"		GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,HO,									
VALVE			8"		10"		GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A351 CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8MA,BS1873,FLANGED ASME B16.5,GO,									

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	188 of 216



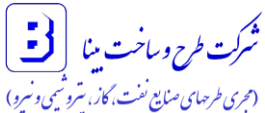

Piping Class:			OR-3							
Design Code:			ASME B31.3				Base Material:		AS (1 ¹ / ₄ Cr ¹ / ₂ Mo)	
Flange Rating & Facing:			150#		RF		Trim Material:		CN5	
Corrosion Allowance:			2.5mm				PWHT:		Yes	
Service:			N2、 Cat、 H2							
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	
Design Pressure(Barg):			19.8	19.5	17.7	15.8	13.8	12.1	10.2	
PIPE										
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A335 P11,ASME B36.10M,SCH 160,							
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M,SCH 160,							
PIPE	2 1/2"	8"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M,SCH XS,							
PIPE	10"	10"	Pipe,SMLS,BE,ASTM A335 P11,ASME B36.10M,SCH 80,							
FITTING										
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,							
FITTING	2"	2"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,							
FITTING	2 1/2"	8"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,							
FITTING	10"	10"	Elbow-45 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,							
FITTING	2"	2"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,							
FITTING	2 1/2"	8"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,							
FITTING	10"	10"	Elbow-90 LR, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,							
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM A182 F11 CL2,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,							
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,							
FITTING	2"	2"	Cap, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,							
FITTING	2 1/2"	8"	Cap, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,							
FITTING	10"	10"	Cap, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,							
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 F11 CL2,MSS SP-97,Class 3000,							
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F),ASTM A182 F11 CL2,MSS SP-97,Class 3000,							
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 F11 CL2,MSS SP-97,							
FITTING	3"	10"	Reducer-Conc. Reducer, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,							
FITTING	3"	10"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 CL2,MSS SP-95,							
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A234 GR.WP11 CL2,MSS SP-95,							
FITTING	3/4"	1 1/2"	Swage Nipple-Conc.. SMLS,POE/TOE.ASTM A234 GR.WP11 CL2.MSS SP-95.							

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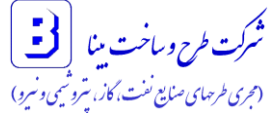

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت پناه (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	189 of 216

Piping Class:			OR-3													
Design Code:			ASME B31.3				Base Material:		AS (1¼Cr ½ Mo)							
Flange Rating & Facing:			150#		RF		Trim Material:		CN5							
Corrosion Allowance:			2.5mm				PWHT:		Yes							
Service:			N2, Cat, H2													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.8		19.5		17.7		15.8		13.8		12.1		10.2	
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 CL2,MSS SP-95,													
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A234 GR.WP11 CL2,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A234 GR.WP11 CL2,MSS SP-95,													
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A234 GR.WP11 CL2,MSS SP-95,													
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A234 GR.WP11 CL2,MSS SP-95,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 F11 CL2,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 F11 CL2,MSS SP-83,Class 3000,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A335 P11,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A335 P11,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A335 P11,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,													
FITTING	2"	2"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,													
FITTING	2 1/2"	8"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,													
FITTING	10"	10"	Tee-Straight, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,													
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 F11 CL2,ASME B16.11,Class 3000,													
FITTING	2"	2"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 160,													
FITTING	2 1/2"	8"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH XS,													
FITTING	10"	10"	Tee-Reducing, SMLS,BW,ASTM A234 GR.WP11 CL2,ASME B16.9,SCH 80,													
FLANGE																
FLANGE	1/2"	10"	Blind,CL 150,RF,ASTM A182 F11 CL2,ASME B16.5,													
FLANGE	1/2"	10"	Blind,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,													
FLANGE	1/2"	1 1/2"	SW,CL 150,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,													
FLANGE	2"	10"	WN,CL 150,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,													
FLANGE	1/2"	1 1/2"	SW,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,													
FLANGE	2"	10"	WN,CL 300,RF,ASTM A182 F11 CL2,ASME B16.5,Same as pipe,													
BLIND																
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A387 GR.11 CL2,ASME B16.48,													
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A387 GR.11 CL2,ASME B16.48,													
GASKET																

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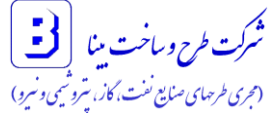

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	190 of 216

Piping Class:			OR-3													
Design Code:			ASME B31.3				Base Material:		AS (1¼Cr ½ Mo)							
Flange Rating & Facing:			150#		RF		Trim Material:		CN5							
Corrosion Allowance:			2.5mm				PWHT:		Yes							
Service:			N2、 Cat、 H2													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.8		19.5		17.7		15.8		13.8		12.1		10.2	
GASKET	1/2"	10"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,													
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: CS - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,													
BOLT & NUT																
STUD BOLT & NUT			Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 Gr.B16,NUT:ASTM A194 Gr.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2, Ceramic Coated,													
VALVE																
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F11 CL2,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS EN ISO 17292,FLANGED ASME B16.5,HO,													
VALVE	2"	6"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A217 WC6,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 608,FLANGED ASME B16.5,HO,													
VALVE	8"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A217 WC6,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 6D,FLANGED ASME B16.5,GO,													
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,Self Operated,													
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,THRD ASME B16.11,Self Operated,													
VALVE	2"	10"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,													
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,													
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/FNPT, ASME B16.11,HO,													
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HO,													
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 F11 CL2,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,													
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HO,													
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A217 WC6,TRIM: CN5 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,GO,													

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	191 of 216



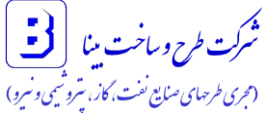

Piping Class:			OR-4													
Design Code:			ASME B31.3			Base Material:		S.S 304/304L								
Flange Rating & Facing:			150#		RF		Trim Material:		CN12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			Cat, Lift gas													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.6		18.3		15.7		14.2		13.2		12.1		10.2	
PIPE																
PIPE		1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP 304/304L,ASME B36.10M,SCH XS,												
PIPE		2"	8"	Pipe,SMLS,BE, ASTM A312 TP 304/304L,ASME B36.10M, SCH XS,												
FITTING																
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	8"	Elbow-45 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH XS,												
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	8"	Elbow-90 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH XS,												
FITTING		1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Cap,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Cap,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	8"	Cap, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH XS,												
FITTING		1/2"	1 1/2"	Olet-Sockolet,Forged,SW, ASTM A182 F304/304L,MSS SP-97,Class 3000,												
FITTING		1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F), ASTM A182 F304/304L,MSS SP-97,Class 3000,												
FITTING		2"	8"	Olet-Weldolet,Forged,BW, ASTM A182 F304/304L,MSS SP-97,												
FITTING		3"	8"	Reducer-Conc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,												
FITTING		3"	8"	Reducer-Ecc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,												
FITTING		3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Conc SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Union-Metallic Seal.Forged.SW. ASTM A182 F304/304L. MSS SP-83,Class 3000.												

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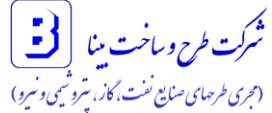

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT Piping Material Specification							CONTRACTOR/CONSULTANT:  	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						01	192 of 216

Piping Class:			OR-4						
Design Code:			ASME B31.3			Base Material:		S.S 304/304L	
Flange Rating & Facing:			150#		RF		Trim Material:		CN12
Corrosion Allowance:			2.5mm			PWHT:		No	
Service:			Cat, Lift gas						
Design Temperature(C):			-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):			19.6	18.3	15.7	14.2	13.2	12.1	10.2
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M), ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,						
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,						
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,						
FITTING	2"	8"	Tee-Straight, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH XS,						
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,						
FITTING	2"	8"	Tee-Reducing, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH XS,						
FLANGE									
FLANGE	1/2"	8"	Flange,Blind,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,						
FLANGE	1/2"	8"	Flange,Blind,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,						
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,						
FLANGE	2"	8"	Flange,WN,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,						
FLANGE	2"	8"	Reducing Flange, WN,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,						
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,						
FLANGE	2"	8"	Flange,WN,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,						
FLANGE	2"	8"	Reducing Flange, WN,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,						
BLIND									
BLINDS	1/2"	8"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304/304L,ASME B16.48,						
BLINDS	1/2"	8"	Spectacle blind,CL 300,RF (RF), ASTM A240 GR.304/304L,ASME B16.48,						
GASKET									
GASKET	1/2"	8"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,						
GASKET	1/2"	8"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,						
BOLT & NUT									
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,						
VALVE									
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F304/304L,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS EN ISO 17292,FLANGED ASME B16.5,HO,						
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 608 FLANGED ASME B16 5 HO						

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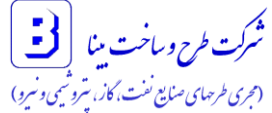

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	193 of 216

Piping Class:			OR-4													
Design Code:			ASME B31.3			Base Material:		S.S 304/304L								
Flange Rating & Facing:			150#		RF		Trim Material:		CN12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			Cat, Lift gas													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.6		18.3		15.7		14.2		13.2		12.1		10.2	
VALVE	6"	8"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF, ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 6D,FLANGED ASME B16.5,GO,													
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,Self Operated,													
VALVE	2"	8"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8 / ASTM A194 Gr.8,BS 1868,FLANGED ASME B16.5,Self Operated,													
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,													
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW/FNPT, ASME B16.11,HO,													
VALVE	2"	8"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 600,FLANGED ASME B16.5,HO,													
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,													
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,HO,													
VALVE	8"	8"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,GO,													
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW, ASTM A182F304/304L,TRIM: CN12 (AS PER API 600),ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 599,SW ASME B16.11,HO,													
VALVE	2"	8"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 599,FLANGED ASME B16.5,HO,													
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFFER / LUG ASME B16.5, ASTM A351Gr.CF8, SHAFT:SS304, DISC: SS304, SEAT: STELLITE6,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 609 CAT B,HO,													
VALVE	6"	8"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFFER / LUG ASME B16.5,ASTM A351Gr.CF8,SHAFT:SS304, DISC: SS304, SEAT: STELLITE6,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 609 CAT B,GO.													

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	194 of 216



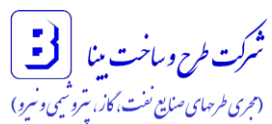

Piping Class:			OR-5														
Design Code:			ASME B31.3						Base Material:				Inconel 600				
Flange Rating & Facing:			150#			RF			Trim Material:				Alloy 600				
Corrosion Allowance:			1.5mm						PWHT:				No				
Service:			IA, CL2, CO2														
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450	475	500
Design Pressure(Barg):			20.0	19.5	17.7	15.8	13.8	12.1	10.2	9.3	8.4	7.4	6.5	5.5	4.6	3.7	2.8
PIPE																	
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,SCH 80S,														
PIPE	2"	6"	Pipe,SMLS,BE,ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,SCH 40S,														
PIPE	8"	12"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B36.10M,SCH 20,														
PIPE	14	36"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B36.10M,SCH 10,														
PIPE	40"	48"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B36.10M,SCH STD,														
FITTING																	
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F),ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,SCH 40S,														
FITTING	8"	12"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-X,ASME B16.9,SCH 20,														
FITTING	14"	36"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-X,ASME B16.9,SCH 10,														
FITTING	40"	48"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-X,ASME B16.9,SCH STD,														
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F),ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,SCH 40S,														
FITTING	8"	12"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-X,ASME B16.9,SCH 20,														
FITTING	14"	36"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-X,ASME B16.9,SCH 10,														
FITTING	40"	48"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-X,ASME B16.9,SCH STD,														
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M),ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	1/2"	1 1/2"	Cap,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F),ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	2"	6"	Cap, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,SCH 40S,														
FITTING	8"	12"	Cap, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,SCH 20,														
FITTING	14"	36"	Cap, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,SCH 10,														
FITTING	40"	48"	Cap, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,SCH STD,														
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),MSS SP-97,Class 3000,														
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM B564 UNS N06600 ANNEALED(INCONEL 600),MSS SP-97,Class 3000,														

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OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 195 of 216



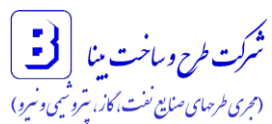

Piping Class:			OR-5														
Design Code:			ASME B31.3							Base Material:				Inconel 600			
Flange Rating & Facing:			150#			RF				Trim Material:				Alloy 600			
Corrosion Allowance:			1.5mm							PWHT:				No			
Service:			IA, CL2, CO2														
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450	475	500
Design Pressure(Barg):			20.0	19.5	17.7	15.8	13.8	12.1	10.2	9.3	8.4	7.4	6.5	5.5	4.6	3.7	2.8
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),MSS SP-97,														
FITTING	3"	6"	Reducer-Conc. Reducer, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,														
FITTING	8"	48"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9,														
FITTING	3"	6"	Reducer-Ecc. Reducer, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,														
FITTING	8"	48"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9,														
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM B366 UNS N06600 GR.WPNCI-S,MSS SP-95,														
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),MSS SP-83,Class 3000,														
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,Same as pipe,														
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,Same as pipe,														
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,Same as pipe,														
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9,SCH 40S,														
FITTING	8"	12"	Tee-Straight,Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9,SCH 20,														
FITTING	14"	36"	Tee-Straight, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9,SCH 10,														
FITTING	40"	48"	Tee-Straight, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9,SCH STD,														
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.11,Class 3000,														
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM B366 UNS N06600 GR.WPNCI-S,ASME B16.9, SCH 40S,														
FITTING	8"	12"	Tee-Reducing,Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9, SCH 20,														
FITTING	14"	36"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9,SCH 10,														
FITTING	40"	48"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 UNS N06600 GR.WPNCI-WX,ASME B16.9,SCH STD,														

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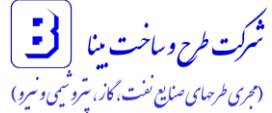

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	196 of 216

Piping Class:	OR-5														
Design Code:	ASME B31.3								Base Material:				Inconel 600		
Flange Rating & Facing:	150#				RF				Trim Material:				Alloy 600		
Corrosion Allowance:	1.5mm								PWHT:				No		
Service:	IA, CL2, CO2														
Design Temperature(C):	-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450	475	500
Design Pressure(Barg):	20.0	19.5	17.7	15.8	13.8	12.1	10.2	9.3	8.4	7.4	6.5	5.5	4.6	3.7	2.8
FLANGE															
FLANGE	1/2"	24"	Flange,Blind,CL 150,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,												
FLANGE	26"	48"	Flange,Blind,CL 150,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.47 Serial B,												
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,												
FLANGE	26"	48"	Flange,Blind,CL 300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.47 Serial B,												
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,Same as pipe,												
FLANGE	2"	8"	Flange,WN,CL 150,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,Same as pipe,												
FLANGE	2"	8"	Flange,WN,CL 150,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,Same as pipe,												
FLANGE	10"	24"	Flange,WN,CL 150,RF, ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5, Same as pipe,												
FLANGE	26"	48"	Flange,WN,CL 150,RF, ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.47 Serial B,												
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,Same as pipe,												
FLANGE	2"	8"	Flange,WN,CL 300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,Same as pipe,												
FLANGE	10"	24"	Flange,WN,CL 300,RF, ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5, Same as pipe,												
FLANGE	26"	48"	Flange,WN,CL 300,RF, ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.47 Serial B, Same as pipe,												
BLIND															
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,												
BLINDS	12"	24"	Blanks and Spacers,CL 150,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,												
BLINDS	26"	48"	Blanks and Spacers,CL 150,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),as per project spec. 3981-00-BA-PI-SPC-022,												
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,												
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,												
BLINDS	26"	48"	Blanks and Spacers,CL 300,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),as per project spec. 3981-00-BA-PI-SPC-022,												
GASKET															
GASKET	1/2"	24"	SPWgasket,CL 150,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.5,4.5 mm,												
GASKET	26"	48"	SPWgasket,CL 150,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,												
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.5,4.5 mm,												
GASKET	26"	48"	SPWgasket,CL 300,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,												
BOLT & NUT															

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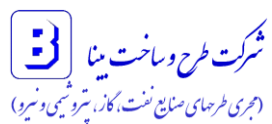

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	197 of 216

Piping Class:			OR-5														
Design Code:			ASME B31.3							Base Material:			Inconel 600				
Flange Rating & Facing:			150#			RF				Trim Material:			Alloy 600				
Corrosion Allowance:			1.5mm							PWHT:			No				
Service:			IA, CL2, CO2														
Design Temperature(C):			-29 to 38	50	100	150	200	250	300	325	350	375	400	425	450	475	500
Design Pressure(Barg):			20.0	19.5	17.7	15.8	13.8	12.1	10.2	9.3	8.4	7.4	6.5	5.5	4.6	3.7	2.8
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B16,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,CERAMIC COATED,														
VALVE																	
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),TRIM: ALLOY 600, SEAT: STELLITE 6,Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,Self Operated,MFR														
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Hinge Pin : 316 SS,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,														
VALVE	26"	48"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 150,LUG TYPE,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Spring: Inconel X750,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 594, ASME B16.47-B,Self Operated,														
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,														
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW/FNPT, ASME B16.11,HO,														
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HO,														
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,GO,														
VALVE	26"	48"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.47-B,GO,														
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,SW ASME B16.11,HO,														
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HO,														
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,GO,														

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	198 of 216



Piping Class:			OR-6													
Design Code:			ASME B31.3			Base Material:		S.S 304/304L								
Flange Rating & Facing:			150#		RF		Trim Material:		CN12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			Gas, Cat													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.6		18.3		15.7		14.2		13.2		12.1		10.2	
PIPE																
PIPE		1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP 304/304L,ASME B36.19M,SCH 80S,												
PIPE		2"	10"	Pipe,SMLS,BE, ASTM A312 TP 304/304L,ASME B36.19M, SCH 80S,												
FITTING																
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	10"	Elbow-45 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,												
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	10"	Elbow-90 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,												
FITTING		1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Cap,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Cap,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	10"	Cap, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,												
FITTING		1/2"	1 1/2"	Olet-Sockolet,Forged,SW, ASTM A182 F304/304L,MSS SP-97,Class 3000,												
FITTING		1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F), ASTM A182 F304/304L,MSS SP-97,Class 3000,												
FITTING		2"	8"	Olet-Weldolet,Forged,BW, ASTM A182 F304/304L,MSS SP-97,												
FITTING		3"	10"	Reducer-Conc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,												
FITTING		3"	10"	Reducer-Ecc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,												
FITTING		3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Conc SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Union-Metallic Seal,Forged,SW, ASTM A182 F304/304L, MSS SP-83,Class 3000,												

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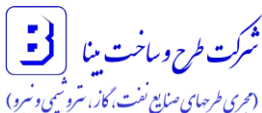

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	Piping Material Specification						CONTRACTOR/CONSULTANT:  	
	MC : 							
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 199 of 216

Piping Class:			OR-6													
Design Code:			ASME B31.3			Base Material:		S.S 304/304L								
Flange Rating & Facing:			150#		RF		Trim Material:		CN12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			Gas, Cat													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			19.6		18.3		15.7		14.2		13.2		12.1		10.2	
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M), ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,													
FITTING	2"	10"	Tee-Straight, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,													
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,													
FITTING	2"	10"	Tee-Reducing, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,													
FLANGE																
FLANGE	1/2"	10"	Flange,Blind,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,													
FLANGE	1/2"	8"	Flange,Blind,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,													
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
FLANGE	2"	10"	Flange,WN,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
FLANGE	2"	10"	Flange,WN,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
BLIND																
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304/304L,ASME B16.48,													
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF), ASTM A240 GR.304/304L,ASME B16.48,													
GASKET																
GASKET	1/2"	10"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,													
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,													
BOLT & NUT																
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,													
VALVE																
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F304/304L,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS EN ISO 17292,FLANGED ASME B16.5,HO,MFR													
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 608,FLANGED ASME B16.5,HO,MFR													
VALVE	6"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF, ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,MNFR,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 6D,FLANGED ASME B16.5,GO,MFR													

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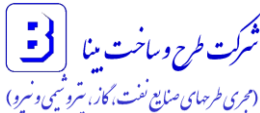

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	PROPANE DEHYDROGENATION (PDH) PROJECT						پناه صنعت پارت Panah Sanat Part	
MC : 	Piping Material Specification						شرکت طرح و ساخت مینا مجموعه طراحی و مهندسی نفت، گاز، پتروشیمی و نیرو	
	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	200 of 216

Piping Class:			OR-6						
Design Code:			ASME B31.3			Base Material:		S.S 304/304L	
Flange Rating & Facing:			150#	RF		Trim Material:		CN12	
Corrosion Allowance:			2.5mm			PWHT:		No	
Service:			Gas, Cat						
Design Temperature(C):			-29 to 38	50	100	150	200	250	300
Design Pressure(Barg):			19.6	18.3	15.7	14.2	13.2	12.1	10.2
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 602,SW ASME B16.11,Self Operated,						
VALVE	2"	10"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1868,FLANGED ASME B16.5,Self Operated,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW/FNPT, ASME B16.11,HO,						
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 600,FLANGED ASME B16.5,HO,						
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,						
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,HO,						
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,GO,						
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW, ASTM A182F304/304L,TRIM: CN12 (AS PER API 600),ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 599,SW ASME B16.11,HO,						
VALVE	2"	10"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 599,FLANGED ASME B16.5,HO,						
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5, ASTM A351Gr.CF8, SHAFT:SS304, DISC: SS304, SEAT: STELLITE6,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 609 CAT B,HO,						
VALVE	6"	10"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A351Gr.CF8,SHAFT:SS304, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 609 CAT B,GO,						

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	Piping Material Specification						CONTRACTOR/CONSULTANT:  	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	201 of 216



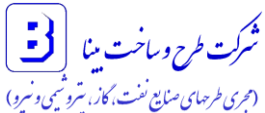

Piping Class:			OR-8			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			150#	RF		Trim Material: CN12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Cat、 N2			
Design Temperature(C):			-29 to 38	50	100	
Design Pressure(Barg):			19.6	18.3	15.7	
PIPE						
PIPE	1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP 304/304L,ASME B36.19M,SCH 160S,			
PIPE	2"	2"	Pipe,SMLS,BE,ASTM A312 TP 304/304L,ASME B36.19M,SCH 160S,			
PIPE	2 1/2"	10"	Pipe,SMLS,BE, ASTM A312 TP 304/304L,ASME B36.19M, SCH 80S,			
FITTING						
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	2"	2"	Elbow-45 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,			
FITTING	2 1/2"	10"	Elbow-45 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	2"	2"	Elbow-90 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,			
FITTING	2 1/2"	10"	Elbow-90 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,			
FITTING	1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M), ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	1/2"	1 1/2"	Cap,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,			
FITTING	2"	2"	Cap, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,			
FITTING	2 1/2"	10"	Cap, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,			
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW, ASTM A182 F304/304L,MSS SP-97,Class 3000,			
FITTING	1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F), ASTM A182 F304/304L,MSS SP-97,Class 3000,			
FITTING	2"	8"	Olet-Weldolet,Forged,BW, ASTM A182 F304/304L,MSS SP-97,			
FITTING	2 1/2"	10"	Reducer-Conc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,			
FITTING	2 1/2"	10"	Reducer-Ecc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE, ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE, ASTM A403 GR.WP304/304L-S,MSS SP-95.			

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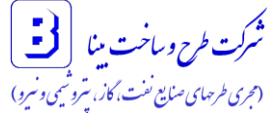

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.	
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 202 of 216

Piping Class:			OR-8				
Design Code:			ASME B31.3		Base Material:	S.S 304/304L	
Flange Rating & Facing:			150#	RF		Trim Material:	CN12
Corrosion Allowance:			1.5mm		PWHT:	No	
Service:			Cat、 N2				
Design Temperature(C):			-29 to 38	50	100		
Design Pressure(Barg):			19.6	18.3	15.7		
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,				
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,				
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW, ASTM A182 F304/304L,MSS SP-83,Class 3000,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M), ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,				
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,				
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,				
FITTING	2"	2"	Tee-Straight, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,				
FITTING	2 1/2"	10"	Tee-Straight, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,				
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,				
FITTING	2"	2"	Tee-Reducing, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,				
FITTING	2 1/2"	10"	Tee-Reducing, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,				
FLANGE							
FLANGE	1/2"	10"	Flange,Blind,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,				
FLANGE	1/2"	8"	Flange,Blind,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,				
FLANGE	1/2"	1 1/2"	Flange,SW,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,				
FLANGE	2"	10"	Flange,WN,CL 150,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,				
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,				
FLANGE	2"	10"	Flange,WN,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,				
BLIND							
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304/304L,ASME B16.48,				
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF), ASTM A240 GR.304/304L,ASME B16.48,				
GASKET							
GASKET	1/2"	10"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,				
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,				
BOLT & NUT							
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2.				

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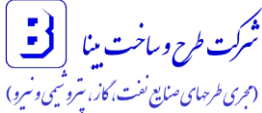

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	203 of 216

Piping Class:		OR-8							
Design Code:		ASME B31.3				Base Material:		S.S 304/304L	
Flange Rating & Facing:		150#		RF		Trim Material:		CN12	
Corrosion Allowance:		1.5mm				PWHT:		No	
Service:		Cat、 N2							
Design Temperature(C):		-29 to 38		50		100			
Design Pressure(Barg):		19.6		18.3		15.7			
VALVE									
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F304/304L,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS EN ISO 17292,FLANGED ASME B16.5,HO,						
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 608,FLANGED ASME B16.5,HO,						
VALVE	6"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF, ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 6D,FLANGED ASME B16.5,GO,						
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,Self Operated,						
VALVE	2"	10"	CHECK VALVE BC SWING TYPE,CL 150,FLANGED, RF,ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1868,FLANGED ASME B16.5,Self Operated,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,						
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW/FNPT, ASME B16.11,HO,						
VALVE	2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 600,FLANGED ASME B16.5,HO,						
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,						
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,MNFR,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,HO,MFR						
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM:CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,GO,						
VALVE	1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW, ASTM A182F304/304L,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 599,SW ASME B16.11,HO,						
VALVE	2"	10"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 150,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 599,FLANGED ASME B16.5,HO,						
VALVE	3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5, ASTM A351Gr.CF8, SHAFT:SS304, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 609 CAT B,HO,						
VALVE	6"	10"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 150,WAFER / LUG ASME B16.5,ASTM A351Gr.CF8,SHAFT:SS304, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B8M / ASTM A194Gr.8MA,API 609 CAT B,GO.						

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	204 of 216



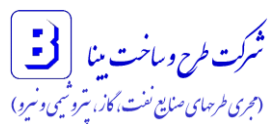

Piping Class:			OR-10													
Design Code:			ASME B31.3			Base Material:		S.S 304/304L								
Flange Rating & Facing:			300#		RF		Trim Material:		CN12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			Catalyst with Hydrogen													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			49.6		47.8		40.9		37.0		34.5		32.5		30.9	
PIPE																
PIPE		1/2"	1 1/2"	Pipe,SMLS,PE,ASTM A312 TP 304/304L,ASME B36.19M,SCH 160S,												
PIPE		2"	2"	Pipe,SMLS,BE,ASTM A312 TP 304/304L,ASME B36.19M,SCH 160S,												
PIPE		2 1/2"	10"	Pipe,SMLS,BE, ASTM A312 TP 304/304L,ASME B36.19M, SCH 80S,												
FITTING																
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,SW,ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Elbow-45 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	2"	Elbow-45 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,												
FITTING		2 1/2"	10"	Elbow-45 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,												
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Elbow-90 R=NPS,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	2"	Elbow-90 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,												
FITTING		2 1/2"	10"	Elbow-90 LR, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,												
FITTING		1/2"	1 1/2"	Plug-Hex. Head,Forged,THRD(NPT-M), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Cap,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		1/2"	1 1/2"	Cap,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,												
FITTING		2"	2"	Cap, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,												
FITTING		2 1/2"	10"	Cap, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,												
FITTING		1/2"	1 1/2"	Olet-Sockolet,Forged,SW, ASTM A182 F304/304L,MSS SP-97,Class 3000,												
FITTING		1/2"	1 1/2"	Olet-Thredolet,Forged,THRD(NPT-F), ASTM A182 F304/304L,MSS SP-97,Class 3000,												
FITTING		2"	8"	Olet-Weldolet,Forged,BW, ASTM A182 F304/304L,MSS SP-97,												
FITTING		2 1/2"	10"	Reducer-Conc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,												
FITTING		2 1/2"	10"	Reducer-Ecc. Reducer, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9,												
FITTING		3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Conc SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage), ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												
FITTING		3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE, ASTM A403 GR.WP304/304L-S,MSS SP-95,												

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	205 of 216





Piping Class:			OR-10													
Design Code:			ASME B31.3			Base Material:		S.S 304/304L								
Flange Rating & Facing:			300#		RF		Trim Material:		CN12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			Catalyst with Hydrogen													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			49.6		47.8		40.9		37.0		34.5		32.5		30.9	
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE), ASTM A403 GR.WP304/304L-S,MSS SP-95,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F), ASTM A182 F304/304L,ASME B16.11,Class 3000,													
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW, ASTM A182 F304/304L,MSS SP-83,Class 3000,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M), ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE, ASTM A312 TP 304/304L,ASME B36.10M,Same as pipe,													
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,													
FITTING	2"	2"	Tee-Straight, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,													
FITTING	2 1/2"	10"	Tee-Straight, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,													
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW, ASTM A182 F304/304L,ASME B16.11,Class 3000,													
FITTING	2"	2"	Tee-Reducing, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 160S,													
FITTING	2 1/2"	10"	Tee-Reducing, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,													
FITTING	2 1/2"	10"	Lateral Tee-Reducing, SMLS,BW, ASTM A403 GR.WP304/304L-S,ASME B16.9, SCH 80S,													
FLANGE																
FLANGE	1/2"	10"	Flange,Blind,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,													
FLANGE	1/2"	8"	Flange,Blind,CL 600,RF, ASTM A182 F304/304L,ASME B16.5,													
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
FLANGE	2"	10"	Flange,WN,CL 300,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
FLANGE	2"	10"	Flange,WN,CL 600,RF, ASTM A182 F304/304L,ASME B16.5,Same as pipe,													
BLIND																
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304/304L,ASME B16.48,													
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF), ASTM A240 GR.304/304L,ASME B16.48,													
GASKET																
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,													
GASKET	1/2"	10"	SPWgasket,CL 600,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,													
BOLT & NUT																

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی و طراحی)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	206 of 216




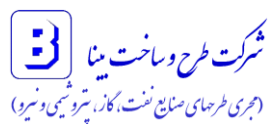
Piping Class:			OR-10													
Design Code:			ASME B31.3			Base Material:		S.S 304/304L								
Flange Rating & Facing:			300#		RF		Trim Material:		CN12							
Corrosion Allowance:			2.5mm			PWHT:		No								
Service:			Catalyst with Hydrogen													
Design Temperature(C):			-29 to 38		50		100		150		200		250		300	
Design Pressure(Barg):			49.6		47.8		40.9		37.0		34.5		32.5		30.9	
STUD BOLT & NUT		-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,												
VALVE																
VALVE		1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 300,FLANGED, RF,ASTM A182 F304/304L,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS EN ISO 17292,FLANGED ASME B16.5,HO,												
VALVE		2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 300,FLANGED, RF,ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 608,FLANGED ASME B16.5,HO,												
VALVE		6"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 300,FLANGED, RF, ASTM A351 CF8,STEM & BALL: 316, SEAT: 316+RPTFE,Seal For Ball Valve AED Viton, ASTM A193 Gr.B8M / ASTM A194Gr.8MA,API 6D,FLANGED ASME B16.5,GO,												
VALVE		1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,Self Operated,												
VALVE		2"	10"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1868,FLANGED ASME B16.5,Self Operated,												
VALVE		1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,												
VALVE		1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW/FNPT, ASME B16.11,HO,												
VALVE		2"	10"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 600,FLANGED ASME B16.5,HO,												
VALVE		1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW, ASTM A182 F304/304L,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 602,SW ASME B16.11,HO,												
VALVE		2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,BS 1873,FLANGED ASME B16.5,HO,												
VALVE		8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8 / ASTM A194 Gr.8,BS 1873,FLANGED ASME B16.5,GO,												
VALVE		1/2"	1 1/2"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 800,SW, ASTM A182F304/304L,TRIM: CN12 (AS PER API 600), ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 599,SW ASME B16.11,HO,												
VALVE		2"	10"	PLUG VALVE Std. PATTERN BB CONE PLUG NO LUBRICATED,CL 300,FLANGED, RF, ASTM A351Gr.CF8,TRIM: CN12 (AS PER API 600),All MNFR,MNFR,ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 599,FLANGED ASME B16.5,HO,MFR												
VALVE		3"	4"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 300,WAFER / LUG ASME B16.5, ASTM A351Gr.CF8, SHAFT:SS304, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 609 CAT B,HO,												
VALVE		6"	10"	BUTTERFLY VALVE TRIPPLE OFFSET,CL 300,WAFER / LUG ASME B16.5,ASTMA351Gr.CF8,SHAFT:SS304, DISC: SS304, SEAT: STELLITE6, ASTM A193 Gr.B8M / ASTM A194 Gr.8MA,API 609 CAT B,GO,												

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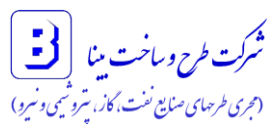

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجموعه طراحی و ساخت پتروشیمی و نیرو)	
	Piping Material Specification							
MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	207 of 216

Piping Class:			OR-11			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Cat			
Design Temperature(C):			-29 to 38	50	100	150
Design Pressure(Barg):			19.0	18.3	15.7	14.2
PIPE						
PIPE	1/2"	8"	Pipe,SMLS,BE,ASTM A312 TP304/304L,ASME B36.19M,SCH 40S,			
FITTING						
FITTING	1/2"	8"	Elbow-45 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	1/2"	8"	Elbow-90 LR, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	1/2"	8"	Cap, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	1/2"	4"	Olet-Weldolet,Forged,BW,ASTM A182 F304/304L,MSS SP-97,			
FITTING	3"	8"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,			
FITTING	3"	8"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,			
FITTING	3/4"	4"	Swage Nipple-Conc., SMLS,BW,ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	3/4"	4"	Swage Nipple-Ecc., SMLS,BW,ASTM A403 GR.WP304/304L-S,MSS SP-95,			
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,BW,ASTM A312 TP304/304L,ASME B36.19M,Same as pipe,			
FITTING	1/2"	8"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FITTING	3/4"	8"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304/304L-S,ASME B16.9,SCH 40S,			
FLANGE						
FLANGE	1/2"	8"	Flange,Blind,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,			
FLANGE	1/2"	8"	Flange,Blind,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,			
FLANGE	1/2"	8"	Flange,WN,CL 150,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
FLANGE	1/2"	8"	Flange,WN,CL 300,RF,ASTM A182 F304/304L,ASME B16.5,Same as pipe,			
BLIND						
BLINDS	1/2"	10"	Spectacle blind,CL 150,RF (RF),ASTM A240 GR.304,ASME B16.48,			
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304,ASME B16.48,			
GASKET						
GASKET	1/2"	10"	SPWgasket,CL 150,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
GASKET	1/2"	10"	SPWgasket,CL 300,For Use With RF Flange,316+Flex. GRAPHITE W/CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,			
BOLT & NUT						
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8M CLASS 2,NUT:ASTM A194 GR.8MA,ASME B1.1 ASME B18.2.1 ASME B18.2.2,			
VALVE						

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	PROPANE DEHYDROGENATION (PDH) PROJECT						
MC :  APG	Piping Material Specification					 شرکت طرح و ساخت مینا (مجموعه طراحی صنایع نفت، گاز، پتروشیمی و نیرو)	
	Project Code	Sec.	Phase Code	Department	Doc. Type		Serial No.
Document Number:	3981-00-DE-PI-SPC-001					Rev.: 01	Page 208 of 216

Piping Class:			OR-11			
Design Code:			ASME B31.3		Base Material:	S.S 304/304L
Flange Rating & Facing:			150#	RF	Trim Material:	CN 12
Corrosion Allowance:			1.5mm		PWHT:	No
Service:			Cat			
Design Temperature(C):			-29 to 38	50	100	150
Design Pressure(Barg):			19.0	18.3	15.7	14.2
VALVE	1/2"	1 1/2"	BALL VALVE SINGLE PIECE FB FLOATING BALL,CL 150,FLANGED, RF,ASTM A182 F316,STEM & BALL: 316, SEAT: 316+RPTFE,SEAL: THERMICULITE 835, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,BS EN ISO 17292,FLANGED ASME B16.5,HO,			
VALVE	2"	4"	BALL VALVE SIDE ENTRY RB FLOATING BALL,CL 150,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+RPTFE,SEAL: THERMICULITE 835, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 608,FLANGED ASME B16.5,HO,			
VALVE	6"	10"	BALL VALVE SIDE ENTRY RB TRUNION MOUNTED,CL 150,FLANGED, RF,ASTM A351 CF8M,STEM & BALL: 316, SEAT: 316+RPTFE,SEAL: THERMICULITE 835, ASTM A193 Gr.B8M CLASS 2/ ASTM A194 Gr.8M A,API 608,FLANGED ASME B16.5,GO,			

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	210 of 216





Piping Class:			OR-12																		
Design Code:			Design Code:			ASME B31.3				Base Material:				S.S 304H							
Flange Rating & Facing:			300#			RF				Trim Material:				CN 12							
Corrosion Allowance:			1.5mm								PWHT:				No						
Service:			Air																		
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600
Design Pressure(Barg):			49.6	47.8	40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9
FITTING	1/2"	1 1/2"	Olet-Sockolet,Forged,SW,ASTM A182 GR. F304H,MSS SP-97,Class 3000,																		
FITTING	1/2"	1 1/2"	Olet-Threadolet,Forged,THRD(NPT-F),ASTM A182 GR. F304H,MSS SP-97,Class 3000,																		
FITTING	2"	8"	Olet-Weldolet,Forged,BW,ASTM A182 GR. F304H,MSS SP-97,																		
FITTING	3"	24"	Reducer-Conc. Reducer, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,																		
FITTING	26"	36"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,																		
FITTING	3"	24"	Reducer-Ecc. Reducer, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,																		
FITTING	26"	36"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Conc., SMLS,BLE/PSE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Conc., SMLS,POE/TOE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Conc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PBE (Applicable for Swage),ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,BLE/PSE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	3/4"	1 1/2"	Swage Nipple-Ecc., SMLS,PLE/TSE,ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	2"	4"	Swage Nipple-Ecc., SMLS,Bevel Large End , MNPT Small End(BLE/TSE),ASTM A403 GR.WP304H-S,MSS SP-95,																		
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Coupling-Full Coupling,Forged,THRD(NPT-F),ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	1/2"	1 1/2"	Union-Metallic Seal,Forged,SW,ASTM A182 GR. F304H,MSS SP-83,Class 3000,																		
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,PBE,ASTM A312 TP304H,ASME B36.19M,Same as pipe,																		
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,TBE(NPT-M),ASTM A312 TP304H,ASME B36.19M,Same as pipe,																		
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,POE/TOE,ASTM A312 TP304H,ASME B36.19M,Same as pipe,																		
FITTING	1/2"	1 1/2"	Tee-Straight,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	2"	16"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 40S,																		
FITTING	18"	18"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																		
FITTING	20"	20"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH XS,																		
FITTING	24"	24"	Tee-Straight, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																		
FITTING	26"	36"	Tee-Straight, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,SCH STD,																		
FITTING	1/2"	1 1/2"	Tee-Reducing,Forged,SW,ASTM A182 GR. F304H,ASME B16.11,Class 3000,																		
FITTING	2"	16"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 40S,																		
FITTING	18"	18"	Tee-Reducing. SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30.																		

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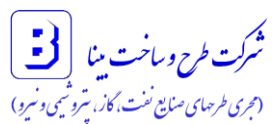

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	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	211 of 216

Piping Class:			OR-12																		
Design Code:			Design Code:				ASME B31.3				Base Material:				S.S 304H						
Flange Rating & Facing:			300#				RF				Trim Material:				CN 12						
Corrosion Allowance:			1.5mm								PWHT:				No						
Service:			Air																		
Design Temperature(C):			38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600
Design Pressure(Barg):			49.6	47.8	40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9
FITTING	20"	20"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH XS,																		
FITTING	24"	24"	Tee-Reducing, SMLS,BW,ASTM A403 GR.WP304H-S,ASME B16.9,SCH 30,																		
FITTING	26"	36"	Tee-Reducing, Welded 100% RT,BW,ASTM A403 GR.WP304H-WX,ASME B16.9,SCH STD,																		
FLANGE																					
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM A182 GR. F304H,ASME B16.5,																		
FLANGE	1/2"	24"	Flange,Blind,CL 600,RF,ASTM A182 GR. F304H,ASME B16.5,																		
FLANGE	26"	36"	Flange,Blind,CL 300,RF,ASTM A182 GR. F304H,ASME B16.47, Serial B,																		
FLANGE	26"	36"	Flange,Blind,CL 600,RF,ASTM A182 GR. F304H,ASME B16.47, Serial B,																		
FLANGE	1/2"	1 1/2"	Flange,SW,CL 300,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
FLANGE	2"	24"	Flange,WN,CL 300,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
FLANGE	26"	36"	Flange,WN,CL 300,RF,ASTM A182 GR. F304H,ASME B16.47, Serial B, Same as pipe,																		
FLANGE	1/2"	1 1/2"	Flange,SW,CL 600,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
FLANGE	2"	24"	Flange,WN,CL 600,RF,ASTM A182 GR. F304H,ASME B16.5,Same as pipe,																		
FLANGE	26"	36"	Flange,WN,CL 600,RF,ASTM A182 GR. F304H,ASME B16.47,Serial B, Same as pipe,																		
BLIND																					
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM A240 GR.304H,ASME B16.48,																		
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304H,ASME B16.48,																		
BLINDS	1/2"	8"	Spectacle blind,CL 600,RF (RF),ASTM A240 GR.304H,ASME B16.48,																		
BLINDS	10"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304H,ASME B16.48,																		
BLINDS	26"	36"	Blanks and Spacers,CL 300,RF (RF),ASTM A240 GR.304H, as per project spec. 3981-00-BA-PI-SPC-022,																		
BLINDS	26"	36"	Blanks and Spacers,CL 600,RF (RF),ASTM A240 GR.304H, as per project spec. 3981-00-BA-PI-SPC-022,																		
GASKET																					
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																		
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																		
GASKET	26"	36"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																		
GASKET	26"	36"	SPWgasket,CL 300,For Use With RF Flange,316 METALLIC+THERMICULITE 835 FILLER CR: SS316 - IR: SS316,ASME B16.20,ASME B16.5,4.5 mm,																		
BOLT & NUT																					
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B8T CLASS 2,NUT:ASTM A194 GR.8T ASME B1.1 ASME B18.2.1 ASME B18.2.2.																		

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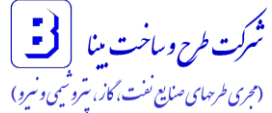

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مهندسی، طراحی، اجرا، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	212 of 216

Piping Class:	OR-12																		
Design Code:	Design Code:				ASME B31.3				Base Material:				S.S 304H						
Flange Rating & Facing:	300#				RF				Trim Material:				CN 12						
Corrosion Allowance:	1.5mm								PWHT:				No						
Service:	Air																		
Design Temperature(C):	38	50	100	150	200	250	300	325	350	375	400	425	450	475	500	538	550	575	600
Design Pressure(Barg):	49.6	47.8	40.9	37.0	34.5	32.5	30.9	30.2	29.6	29.0	28.4	28.0	27.4	26.9	26.5	24.4	23.6	20.8	16.9
VALVE																			
VALVE	1/2"	1 1/2"		CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN12 (316+HF) (AS PER API 600),Hinge Pin & Spring For Check Valve 316 SS,ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 602,SW ASME B16.11,Self Operated,															
VALVE	2"	24"		CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN12 (316+HF) (AS PER API 600),Hinge Pin : 316 SS,ASTM A193 Gr.B8 / ASTM A194 Gr.8,BS 1868,FLANGED ASME B16.5,Self Operated,															
VALVE	1/2"	1 1/2"		GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN12 (316+HF) (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 602,SW ASME B16.11,HO,															
VALVE	1/2"	1 1/2"		GATE VALVE BB OS&Y SOLID WEDGE,CL 800,SW/FNPT,ASTM A182 GR. F304H,TRIM: CN12 (316+HF) (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 602,SW/FNPT, ASME B16.11,HO,															
VALVE	2"	12"		GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN12 (316+HF) (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8 / ASTM A194 Gr.8 API 600,FLANGED ASME B16.5,HO,															
VALVE	14"	24"		GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN12 (316+HF) (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 600,FLANGED ASME B16.5,GO,															
VALVE	1/2"	1 1/2"		GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 800,SW,ASTM A182 GR. F304H,TRIM: CN12 (316+HF) (AS PER API 600),Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B8 / ASTM A194 Gr.8,API 602,SW ASME B16.11,HO,															
VALVE	2"	6"		GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN12 (316+HF) (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8 / ASTM A194 Gr.8,BS 1873,FLANGED ASME B16.5,HO,															
VALVE	8"	14"		GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A351 CF8 MIN.0.04%C,TRIM: CN12 (316+HF) (AS PER API 600),Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B8 / ASTM A194 Gr.8,BS 1873,FLANGED ASME B16.5,GO,															

OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	213 of 216



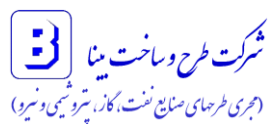

Piping Class:			OR-17																
Design Code:			ASME B31.3								Base Material:				INCONEL 600				
Flange Rating & Facing:			300#			RF					Trim Material:				Alloy 600+Stellite				
Corrosion Allowance:			1.5mm								PWHT:				No				
Service:			Regeneration Gas Chlorine Gas 、 Regeneration Gas																
Design Temperature(C):			50	100	150	200	250	300	350	400	450	475	500	538	550	575	600	625	650
Design Pressure(Barg):			51.7	51.5	50.3	48.6	46.3	42.9	40.3	36.5	33.7	31.7	28.2	16.5	13.9	9.4	6.6	5.1	4.7
PIPE																			
PIPE	1/2"	1 1/2"	Pipe,SMLS,BE,ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,SCH 80S,																
PIPE	2"	6"	Pipe,SMLS ,BE,ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,SCH 40S,																
PIPE	8"	16"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B168 Gr. UNS N06600, HOT ROLLED ANNEALED(INCONEL 600),ASME B36.19M,SCH 40S,																
PIPE	18"	24"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B168 GR.UNS N06600, HOT ROLLED ANNEALED(INCONEL 600),ASME B36.19M,SCH 80S,																
PIPE	26"	26"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B36.10M,THK. 15.88 mm,																
PIPE	28"	32"	Pipe,EFW Long. Seam 100%RT,BE,ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B36.10M, SCH 30,																
FITTING																			
FITTING	1/2"	1 1/2"	Elbow-45 LR, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 80S,																
FITTING	2"	6"	Elbow-45 LR, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 40S,																
FITTING	8"	16"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-X,ASME B16.9,SCH 40S,																
FITTING	18"	24"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-X,ASME B16.9,SCH XS,																
FITTING	26"	26"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-X,ASME B16.9,THK. 15.88 mm,																
FITTING	28"	32"	Elbow-45 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-X,ASME B16.9, SCH 30,																
FITTING	1/2"	1 1/2"	Elbow-90 LR, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 80S,																
FITTING	2"	6"	Elbow-90 LR, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 40S,																
FITTING	8"	16"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,SCH 40S,																
FITTING	18"	24"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,SCH 80S,																
FITTING	26"	26"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,THK. 15.88 mm,																
FITTING	28"	32"	Elbow-90 LR, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9, SCH 30,																
FITTING	1/2"	1 1/2"	Cap, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 80S,																
FITTING	2"	6"	Cap, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 40S,																
FITTING	8"	16"	Cap, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 40S,																
FITTING	18"	24"	Cap, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 80S,																
FITTING	26"	26"	Cap, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9, THK. 15.88 mm,																
FITTING	28"	32"	Cap, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9, , SCH 30,																
FITTING	1/2"	8"	Olet-Weldolet,Forged,BW,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),MSS SP-97,																
FITTING	3/4"	6"	Reducer-Conc. Reducer, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,Sch Same as pipe,																
FITTING	8"	32"	Reducer-Conc. Reducer, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,Sch Same as pipe,																

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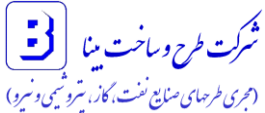

OWNER:  PARS PETROCHEMICAL COMPANY PROPANE DEHYDROGENATION (PDH) PROJECT	CONTRACTOR/CONSULTANT:  							
							Piping Material Specification	
	MC : 	Project Code	Sec.	Phase Code	Department	Doc. Type		
Document Number:	3981-00-DE-PI-SPC-001						Rev.: 01	Page 214 of 216

Piping Class:			OR-17																
Design Code:			ASME B31.3								Base Material:				INCONEL 600				
Flange Rating & Facing:			300#			RF					Trim Material:				Alloy 600+Stellite				
Corrosion Allowance:			1.5mm								PWHT:				No				
Service:			Regeneration Gas Chlorine Gas 、 Regeneration Gas																
Design Temperature(C):			50	100	150	200	250	300	350	400	450	475	500	538	550	575	600	625	650
Design Pressure(Barg):			51.7	51.5	50.3	48.6	46.3	42.9	40.3	36.5	33.7	31.7	28.2	16.5	13.9	9.4	6.6	5.1	4.7
FITTING	3/4"	6"	Reducer-Ecc. Reducer, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,Sch Same as pipe,																
FITTING	8"	32"	Reducer-Ecc. Reducer, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,Sch Same as pipe,																
FITTING	1/2"	1 1/2"	Nipple-Long Pattern, length:100mmSMLS,BBE,ASTM B167 GR.UNS N06600 ANNEALED(INCONEL 600),ASME B36.19M,Same as pipe,																
FITTING	1/2"	1 1/2"	Tee-Straight, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 80S,																
FITTING	2"	6"	Tee-Straight, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 40S,																
FITTING	8"	16"	Tee-Straight, SMLS,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,SCH 40S,																
FITTING	18"	24"	Tee-Straight, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,SCH 80S,																
FITTING	26"	26"	Tee-Straight, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9, THK. 15.88 mm,																
FITTING	28"	32"	Tee-Straight, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9, SCH 30,																
FITTING	1/2"	1 1/2"	Tee-Reducing, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 80S,																
FITTING	2"	6"	Tee-Reducing, SMLS,BW,ASTM B366 GR.WPNCI-S,ASME B16.9,SCH 40S,																
FITTING	8"	16"	Tee-Reducing, SMLS,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9,SCH 40S,																
FITTING	18"	24"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9, SCH 80S,																
FITTING	26"	26"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9, THK. 15.88 mm,																
FITTING	28"	32"	Tee-Reducing, Welded 100% RT,BW,ASTM B366 GR.WPNCI-WX,ASME B16.9, SCH 30,																
FLANGE																			
FLANGE	1/2"	24"	Flange,Blind,CL 300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,																
FLANGE	26"	32"	Flange,Blind,CL 300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.47 Serial B,																
FLANGE	1/2"	24"	Flange,Flange,Blind,CL 600,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,																
FLANGE	26"	32"	Flange,Blind,CL 600,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.47 Serial B,																
FLANGE	1/2"	24"	Flange,WN,CL 300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,Same as pipe,																
FLANGE	1/2"	24"	Flange,WN,CL 600,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),ASME B16.5,Same as pipe,																
BLIND																			
BLINDS	1/2"	10"	Spectacle blind,CL 300,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,																
BLINDS	12"	24"	Blanks and Spacers,CL 300,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,																
BLINDS	26"	32"	Blanks and Spacers,CL 300,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),as per project spec. 3981-00-BA-PI-SPC-022,																
BLINDS	1/2"	10"	Spectacle blind,CL 600,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,																
BLINDS	12"	24"	Blanks and Spacers,CL 600,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),ASME B16.48,																
BLINDS	26"	32"	Blanks and Spacers,CL 600,RF (RF),ASTM B168 GR.UNS N06600 HOT ROLLED ANNEALED(INCONEL 600),as per project spec. 3981-00-BA-PI-SPC-022,																

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OWNER:  شرکت پتروشیمی پارس Pars Petrochemical Co.	PARS PETROCHEMICAL COMPANY						CONTRACTOR/CONSULTANT:  پناه صنعت پارت Panah Sanat Part	
	PROPANE DEHYDROGENATION (PDH) PROJECT						 شرکت طرح و ساخت مینا (مجری طرح های صنایع نفت، گاز، پتروشیمی و نیرو)	
	Piping Material Specification							
MC :  APG	Project Code	Sec.	Phase Code	Department	Doc. Type	Serial No.		
Document Number:	3981-00-DE-PI-SPC-001						Rev.:	Page
							01	215 of 216

Piping Class:		OR-17																
Design Code:		ASME B31.3									Base Material:				INCONEL 600			
Flange Rating & Facing:		300#			RF						Trim Material:				Alloy 600+Stellite			
Corrosion Allowance:		1.5mm									PWHT:				No			
Service:		Regeneration Gas Chlorine Gas 、 Regeneration Gas																
Design Temperature(C):		50	100	150	200	250	300	350	400	450	475	500	538	550	575	600	625	650
Design Pressure(Barg):		51.7	51.5	50.3	48.6	46.3	42.9	40.3	36.5	33.7	31.7	28.2	16.5	13.9	9.4	6.6	5.1	4.7
GASKET																		
GASKET	1/2"	24"	SPWgasket,CL 300,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.5,4.5 mm,															
GASKET	26"	32"	SPWgasket,CL 300,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,															
GASKET	1/2"	24"	SPWgasket,CL 600,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.5,4.5 mm,															
GASKET	26"	32"	SPWgasket,CL 600,For Use With RF Flange,ALLOY UNS N06600 METALLIC+THERMICULITE 835 FILLER CR: UNS N06600 - IR: UNS N06600,ASME B16.20,ASME B16.47 SERIES B,4.5 mm,															
BOLT & NUT																		
STUD BOLT & NUT	-	-	Full Threaded Stud Bolt / 2 Heavy Hex Nuts,BOLT:ASTM A193 GR.B16,NUT:ASTM A194 GR.7,ASME B1.1 ASME B18.2.1 ASME B18.2.2,CERAMIC COATED,															
VALVE																		
VALVE	1/2"	1 1/2"	CHECK VALVE BC PISTON LIFT TYPE WITH SPRING,CL300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),TRIM: ALLOY 600, SEAT: STELLITE 6,Hinge Pin & Spring For Check Valve Inconel X750,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,Flanged End , ASME B16.5,Self Operated,															
VALVE	2"	24"	CHECK VALVE BC SWING TYPE,CL 300,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Hinge Pin : Inconel 718,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1868,FLANGED ASME B16.5,Self Operated,															
VALVE	26"	32"	CHECK VALVE / RETAINERLESS CHECK VALVE DUAL PLATE,CL 300,LUG TYPE,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Spring: Inconel X750,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 594, ASME B16.47-B,Self Operated,															
VALVE	1/2"	1 1/2"	GATE VALVE BB OS&Y SOLID WEDGE,CL300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602,Flanged End,ASME B16.5,HO,															
VALVE	2"	12"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,HO,															
VALVE	14"	24"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.5,GO,															
VALVE	26"	32"	GATE VALVE BB OS&Y FLEXIBLE WEDGE,CL 300,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 600,FLANGED ASME B16.47-B,GO,															
VALVE	1/2"	1 1/2"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL300,RF,ASTM B564 UNS N06600 ANNEALED(INCONEL 600),TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,API 602, Flanged End, ASME B16.5,HO,															
VALVE	2"	6"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite,ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,HO,															
VALVE	8"	10"	GLOBE VALVE BB OS&Y SWIVEL PLUG TYPE DISC,CL 300,FLANGED, RF,ASTM A494 GR.CY40 CL2,TRIM: ALLOY 600, SEAT: STELLITE 6,Packing For Gate & Globe Flexible Graphite, ASTM A193 Gr.B16 / ASTM A194 Gr.7,BS 1873,FLANGED ASME B16.5,GO,															

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Rev.:	Page											
01	216 of 216											
Document Number:	3981-00-DE-PI-SPC-001											

8.Attachment 1. Branch Tables