



Toase-ehe Park Sanati Gohar Ofoh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 1 of 56

STYRENE PARK OFFSITE

Document Title:

PIPING MATERIAL SPECIFICATION

| REV. | DATE | DESCRIPTION | PREPARED | CHECKED | APPROVED |
|------|-----------|---------------------------|-----------|--------------|----------|
| R3 | 20-Aug-18 | ISSUED FOR APPROVAL (IFA) | AR.Salehi | S.Behniyafar | R.Memar |
| R2 | 26-Sep-17 | ISSUED FOR APPROVAL (IFA) | AR.Salehi | R.Memar | R.Memar |
| R1 | 19-Aug-17 | ISSUED FOR COMMENT (IFC) | AR.Salehi | R.Memar | R.Memar |
| 00 | 19-Apr-16 | ISSUED FOR COMMENT | M.S. | M.R.S. | S.M. |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 2 of 56

Tabulation of Revised Pages

| Page | Revisions | | | | | | |
|------|-----------|----|----|----|----|----|----|
| | R0 | R1 | R2 | R3 | R4 | R5 | R6 |
| 1 | X | X | X | X | | | |
| 2 | X | X | X | X | | | |
| 3 | X | X | | | | | |
| 4 | X | X | | | | | |
| 5 | X | X | | | | | |
| 6 | X | X | | | | | |
| 7 | X | X | | | | | |
| 8 | X | X | | | | | |
| 9 | X | X | | | | | |
| 10 | X | X | | | | | |
| 11 | X | X | | | | | |
| 12 | X | X | | | | | |
| 13 | X | X | | | | | |
| 14 | X | X | | | | | |
| 15 | X | X | | | | | |
| 16 | X | X | | | | | |
| 17 | X | X | | | | | |
| 18 | X | X | | | | | |
| 19 | X | X | | | | | |
| 20 | X | X | | | | | |
| 21 | X | X | | | | | |
| 22 | X | X | | | | | |
| 23 | X | X | | | | | |
| 24 | X | X | | | | | |
| 25 | X | X | | | | | |
| 26 | X | X | | | | | |
| 27 | X | X | | | | | |
| 28 | X | X | | | | | |
| 29 | X | X | | | | | |
| 30 | X | X | | | | | |
| 31 | X | X | | | | | |
| 32 | X | X | | | | | |
| 33 | X | X | | | | | |
| 34 | X | X | | | | | |
| 35 | X | X | | | | | |
| 36 | X | X | | | | | |
| 37 | | X | | | | | |
| 38 | | X | | | | | |
| 39 | | X | | | | | |
| 40 | | X | | | | | |
| 41 | | X | | | | | |
| 42 | | X | | | | | |
| 43 | | X | | | | | |
| 44 | | X | | | | | |
| 45 | | X | | | | | |
| 46 | | X | | | | | |
| 47 | | X | | | | | |
| 48 | | X | | | | | |
| 49 | | X | | | | | |
| 50 | | X | | | | | |
| 51 | | X | | | | | |
| 52 | | X | | | | | |
| 53 | | X | | | | | |
| 54 | | X | | | | | |
| 55 | | X | | | | | |
| 56 | | X | | | | | |
| 57 | | | | | | | |
| 58 | | | | | | | |
| 59 | | | | | | | |
| 60 | | | | | | | |
| 61 | | | | | | | |
| 62 | | | | | | | |
| 63 | | | | | | | |
| 64 | | | | | | | |
| 65 | | | | | | | |
| 66 | | | | | | | |
| 67 | | | | | | | |
| 68 | | | | | | | |
| 69 | | | | | | | |
| 70 | | | | | | | |
| 71 | | | | | | | |
| 72 | | | | | | | |
| 73 | | | | | | | |
| 74 | | | | | | | |
| 75 | | | | | | | |
| 76 | | | | | | | |
| 77 | | | | | | | |
| 78 | | | | | | | |
| 79 | | | | | | | |
| 80 | | | | | | | |





| | | | |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------|
|  <p>پتروشیمی توسعه پارک صنعتی گوهر افق</p> | <p>Toase-eh Park Sanati Gohar Ofogh Petrochemical Co. CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE</p> | |  <p>BINA Consulting Eng. Co.</p> |
| | <p>Document Title: PIPING MATERIAL SPECIFICATION</p> | | |
| | <p>Document Number: EI027-000-EB-PI-SPC-002</p> | | <p>Rev.R3</p> |

Table of Contents

| | | |
|---|-------------------------------------|---|
| 1 | INTRODUCTION | 4 |
| 2 | DEFINITIONS | 4 |
| 3 | GENERAL INFORMATION..... | 4 |
| 4 | REFERENCE CODES AND STANDARDS | 5 |
| 5 | LINE CLASS IDENTIFICATION..... | 6 |
| 6 | LINE CLASS INDEX | 7 |
| 7 | PIPING CLASSES | 8 |

| | | |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|  <p>پتروشیمی توسعه پارک صنعتی گوهر افق</p> | <p>Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co. CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE</p> |  <p>BINA Consulting Eng. Co.</p> |
| | <p>Document Title: PIPING MATERIAL SPECIFICATION</p> | |
| | <p>Document Number: EI027-000-EB-PI-SPC-002</p> | <p>Rev.R3</p> |

1 INTRODUCTION

Creation and development of chain units of Styrene Monomer is the mission of Gohar Ofogh Industrial Park. This company is joint investment of 4 companies including :

- Petro-Entekhab PolyStyrene Plant
- SADAF ESBR PLANT
- Kimiya Sanaye Dalahoo Expandable Polystyrene Plant
- JAM ABS AND RUBBERS PLANT

is located in Assaluyeh.

Feed and utility lines and network construction, a 10,000 MT Styrene Monomer tank construction, Peroxide and its sidelong equipment warehouse are amongst this company's missions. This industrial Park was established on 2011 in an area of 9 acres.

Some of the ongoing projects of this company are:

- ABS-Rubber project
- ESBR project
- EPS project
- Poly Styrene

2 DEFINITIONS

Owner/Client: Gohar Ofogh Industrial Park



Engineering Consultant: BINA Consultant Engineering Company

Project: Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
 CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE
 PARK OFFSITE

Location: Assaluyeh zone, Boushehr province, IRAN

3 GENERAL INFORMATION



- 3.1 In case of any conflict between this document and international codes and standards this document shall be followed.

| | | |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|  <p>پتروشیمی توسعه پارک صنعتی گوهر افق</p> | <p>Toase-eh Park Sanati Gohar Ofogh Petrochemical Co. CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE</p> |  <p>BINA Consulting Eng. Co.</p> |
| | <p>Document Title: PIPING MATERIAL SPECIFICATION</p> | |
| | <p>Document Number: EI027-000-EB-PI-SPC-002</p> | <p>Rev.R3</p> |

4 REFERENCE CODES AND STANDARDS

The latest edition or version of the following code, standard and specification are referenced to this specification.

- ✓ IPS Iranian Petroleum standards
 - IPS-E-GN-100 “Engineering Standards for Units”
 - IPS-E-TP-740 “Engineering Standard for Corrosion Consideration in Material Selection”
 - IPS-E-PI-221 “Engineering Standard for Piping Material Selection”
- ✓ ASME AMERICAN SOCIETY OF MECHANICAL ENGINEERS
 - B1.1 “Unified Inch Screw Threads (UN and UNR Thread Form)”
 - B1.20.1 “Pipe Threads, General Purpose (Inch)”
 - B16.10 “Face to Face and End to End Dimensions of Valves”
 - B16.11 “Forged Steel Fittings, Socket Welding and Threaded”
 - B16.20 “Metallic Gaskets for Pipe Flanges-Ring Joint, Spiral-Wound, and Jacketed”
 - B16.21 “Nonmetallic Flat Gaskets for Pipe Flanges”
- ✓ ISO International Organization for Standardization
 - 160 “Asbestos-Cement Pressure Pipes and Joints”
 - 2531 “Ductile Iron Pipes, Fittings and accessories for pressure pipelines”
 - Piping
- ✓ API American Petroleum Institute
 - API-598 “Valve Inspection and Test”
 - API-599 “Metal Plug Valves-Flanged and Welding Ends”
 - API-600 “Steel Gate Valves, Flanged and Buttwelding Ends”

| | | |
|---------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|
|  <p>پتروشیمی توسعه پارک صنعتی گوهر افق</p> | <p>Toase-eh Park Sanati Gohar Ofogh Petrochemical Co. CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF STYRENE PARK OFFSITE</p> |  <p>BINA Consulting Eng. Co.</p> |
| | <p>Document Title: PIPING MATERIAL SPECIFICATION</p> | |
| | <p>Document Number: EI027-000-EB-PI-SPC-002</p> | <p>Rev.R3</p> |

| | |
|----------|-----------------------------------------------------------------------------------------------------------------------|
| API-601 | “Metallic Gasket for Raised-Face, Pipe Flanges and Flanged Connections (Double Jacketed Corrugated and Spiral wound)” |
| API-60 2 | “Compact Steel Gate Valves-Flanged, Threaded, Welding andExtended-Body Ends” |
| API-609 | “Butterfly valves, Lug-Type and Wafer-Type” |
| API-6D | “Pipeline Valves (Gate, Plug, Ball and Check-Valves)” |
| API-941 | “Steels for Hydrogen Service at Elevated Temperature and Pressure in Petroleum Refineries and Petrochemical Plants” |
| ✓ BS | British Standard |
| BS-5146 | “Specification for Inspection and Test of Steel Valves for the petroleum, petrochemical and allied inspection” |
| BS-5352 | “Steel Wedge Gate, Globe and Check Valves” |
| BS-5351 | “Steel Ball Valves” |

5 LINE CLASS IDENTIFICATION

Piping Class NUMBERING :

a) Rating

| | |
|----------|-----|
| D | 150 |
| E | 300 |
| G | 600 |

b) Material

| | |
|----------|------------------------------------------------------|
| A | Carbon Steel |
| D | 1.25 Cr-0.5 Mo Alloy Steel _ 1 Cr-0.5 Mo Alloy Steel |
| J | 304 Stainless Steel |
| L | 316 Stainless Steel |
| Q | Galvanized Carbon Steel |
| X | Epoxy Lining and/or 3 Layers PE Coated |
| Z | Other Materials |

C) Order N°

Serial Number for Piping Classes of Same Rating and Basic Material

Example : DA01 , DA02 ,



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 7 of 56

6 LINE CLASS INDEX

| Line Class | Flange Rating/Facing | Basic Material C.A. | Pres./Temp. Limit Barg/C | Services | Service Symbols |
|------------|----------------------|-------------------------|--------------------------|--------------------------------------------------|-----------------------|
| DA01 | CL 150/RF | CS + 1.5mm | 85/16 | PLANT AIR STYRENE 1,3BUTADIENE NITROGEN | PA ST BD NIT |
| DA03 | CL 150/RF | CS + 3mm | 85/16 | NITROGEN DRAIN ATMOSPHERIC VENT | NIT DR AV |
| DA05 | CL 150/RF | CS + 3mm | 65/12 | SERVICE WATER | UW |
| DA10 | CL 150/RF | CS + 3mm | 85/11 | COOLING BLOW DOWN STEAM CONDENSATE | CB SC |
| DJ02 | CL 150/RF | SS304/304L + 0mm | 65/15 | COOLING WATER RETURN COOLING WATER SUPPLY | CWR CWS |
| DL01 | CL 150/RF | SS316/316L + 0mm | 85/14 | DEMIN WATER | DM |
| DQ01 | CL 150/RF | GALV. CS + 0mm | 65/12 | POTABLE WATER INSTRUMENT AIR | PW IA |
| DZ01 | CL 150/RF | 3LPE COATED CS + 3mm | 65/11 | CHEMICAL SEWER OILY SEWER SANITARY SEWER | COC POC SN |
| EA01 | CL 300/RF | CS + 1.5mm | 85/35 | NATURAL GAS FUEL GAS | NG FG |
| GD01 | CL 600/RF | 1 1/4Cr-1/2Mo + 1.5mm | 470/47 | HIGH PRESSURE STEAM | HS |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 8 of 56

7 PIPING CLASSES

DA01

Service Plant Air, Styrene, 1,3Butdiene, Nitrogen

Design code: ASME B31.3

Flange Rating/Facing/Face Finishing

| from | to | Code | |
|------|----|------------|------------------------|
| ½ | 14 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe Thickness | | Fitting Thk | Nipple | |
|------|----------------|-----|-------------|--------|-----|
| | Thk | Sch | | Thk | Sch |
| ½ | 3.73 | 80 | 3.73 | 80 | |
| ¾ | 3.91 | 80 | 3.91 | 80 | |
| 1 | 4.55 | 80 | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | 5.08 | 80 | |
| 2 | 3.91 | STD | 3.91 | 80 | |
| 3 | 5.49 | STD | | | |
| 4 | 6.02 | STD | | | |
| 6 | 7.11 | STD | | | |
| 8 | 7.04 | 30 | | | |
| 10 | 7.8 | 30 | | | |
| 12 | 8.38 | 30 | | | |
| 14 | 9.53 | 30 | | | |

Fitting Class

| opt. | from | to | Code | SW | THDD | PN |
|------|------|-----|-------------|------|------|----|
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

Corrosion Allowance

| Size | Internal | External |
|--------------|----------|----------|
| from ½ to 14 | 1.5 | 0 |

Quality Class

| Size | Weld Spec. |
|--------------|-------------------|
| from ½ to 14 | Per Detail Design |

Design Limit

| Temp. | Size up to |
|---------|-----------------|
| °F | 14 |
| -20-100 | Pressure in psi |
| 200 | 285 |
| | 260 |

Note: Ball valves use is limited to 180 °C
 Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 9 of 56

DA01

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|
| 1/2 | A | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 |

| Legend | |
|--------|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 10 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------------------------------------------------|------------------------|----------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA01 | | | | |
| PIPE | | | | |
| ½ | 1 ½ | PIPE, PE | | ASTM A106 GR.B-SMLS |
| 2 | 14 | PIPE, BE | | ASTM A106 GR.B-SMLS |
| CONNECTION FLANGE | | | | |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| BLIND FLANGE | | | | |
| ½ | 14 | BLIND FLANGE -ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| SPECTACLE BLIND | | | | |
| ½ | 12 | SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| 14 | 14 | BLANK AND SPACER | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| ELBOW | | | | |
| ½ | 1 ½ | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| REDUCER | | | | |
| 2 | 14 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| 2 | 14 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| CAP | | | | |
| ½ | 1 ½ | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | CAP-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| COUPLING | | | | |
| ½ | 1 ½ | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| MALE PLUG | | | | |
| ½ | 1 ½ | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A105 Normalized |
| NIPPLES | | | | |
| ½ | ½ | NIPPLE-THDD/THDD-BS3799 | | ASTM A106 GR.B-SMLS |
| ½ | 1 ½ | NIPPLE-THDD/PE-BS3799 | | ASTM A106 GR.B-SMLS |
| SWAGE NIPPLES | | | | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A234 WPB-SMLS |



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 11 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------|-------------------------------------------|------------------------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA01 | | | | |
| | ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| TEE | | | | |
| | ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | 2 | 14 | TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| | 2 | 14 | REDUCING TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| WELDOLET | | | | |
| | 2 | 10 | WELDOLET MSS SP-97 | ASTM A105 Normalized |
| THREADOLET | | | | |
| | ½ | 1 ½ | THREADOLET-THD END-MSS DP-97 | 3000 ASTM A105 Normalized |
| SOCKOLET | | | | |
| | ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 ASTM A105 Normalized |
| FLANGE INSERT | | | | |
| | 1 | 1 ½ | LWN FLANGE | CL.300 RF 125µinch. Ra ASTM A105 Normalized |
| GASKET | | | | |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL150 316S.S+98% GRAPHITE-CS. OUT RING |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL300 316S.S+98% GRAPHITE-CS. OUT RING |
| BOLTS | | | | |
| | ¾ | 4 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | ASTM A193 Gr. B7/A194 Gr.2H |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 12 of 56

| VALVES | | | |
|--------------|-------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size from | to | | Type |
| DA01 | | | |
| ½ | 1 ½ | GV-100 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | GV-101 | Carbon Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL-150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GL-200 | Carbon Steel-Globe-WB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 12 | GL-201 | Carbon Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.150-RF-125µinch.Ra Body Material: ASTM 216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | CH-300 | Carbon Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | CH-301 | Carbon Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GV-104 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800-SW×THDF Body Material: ASTM A105 Normalized Trim Material:13Cr(TRIM No. 8) |
| ½ | 1 1/2 | BL-401 | Carbon Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL. 800- SW with two 100mm nipples Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 2 | 6 | BL-402 | Carbon Steel-Ball-Side Entry-FB-Floating Ball- API608-CL.150- RF-125µinch.Ra Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 8 | 14 | BL-404 | Carbon Steel-Ball-Side Entry-FB-Trunnion Ball-API 608-CL.150- RF-125µinch.Ra Body Material:ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| STRAINER | | | |
| Size from | to | | Type |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 13 of 56

DA03

Service Nitrogen, Drain, Atmospheric Vent

Design code: ASME B31.3

Flange Rating/Facing/Face Finishing

| from | to | Code | |
|------|----|------------|------------------------|
| ½ | 14 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|------|-----|-------------|------|--------|-----|
| | Thk | Sch | Fitting Thk | Thk | Sch | Thk |
| ½ | 3.73 | 80 | | 3.73 | 80 | |
| ¾ | 3.91 | 80 | | 3.91 | 80 | |
| 1 | 4.55 | 80 | | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | | 5.08 | 80 | |
| 2 | 3.91 | STD | | 3.91 | 40 | |
| 3 | 5.49 | STD | | | | |
| 4 | 6.02 | STD | | | | |
| 6 | 7.11 | STD | | | | |
| 8 | 7.04 | 30 | | | | |
| 10 | 7.8 | 30 | | | | |
| 12 | 8.38 | 30 | | | | |
| 14 | 9.53 | 30 | | | | |

Fitting Class

| opt. | from | to | Code | SW | THDD | PN |
|------|------|-----|-------------|------|------|----|
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

Corrosion Allowance

| Size | Internal | External |
|--------------|----------|----------|
| from ½ to 14 | 3 | 0 |

Quality Class

| Size | Weld Spec. |
|--------------|-------------------|
| from ½ to 14 | Per Detail Design |

Design Limit

| Temp. | Size up to |
|---------|-----------------|
| °F | 14 |
| -20-100 | Pressure in psi |
| 200 | 285 |
| | 260 |

Note: Ball valves use is limited to 180 °C
Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 14 of 56

DA03

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|--|
| 1/2 | A | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | |

Legend

| | |
|----|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 15 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------------------------------------------------|------------------------|----------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA03 | | | | |
| PIPE | | | | |
| ½ | 1 ½ | PIPE, PE | | ASTM A106 GR.B-SMLS |
| 2 | 14 | PIPE, BE | | ASTM A106 GR.B-SMLS |
| CONNECTION FLANGE | | | | |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| BLIND FLANGE | | | | |
| ½ | 14 | BLIND FLANGE -ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| SPECTACLE BLIND | | | | |
| ½ | 12 | SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| 14 | 14 | BLANK AND SPACER | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| ELBOW | | | | |
| ½ | 1 ½ | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| REDUCER | | | | |
| 2 | 14 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| 2 | 14 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| CAP | | | | |
| ½ | 1 ½ | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | CAP-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| COUPLING | | | | |
| ½ | 1 ½ | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| MALE PLUG | | | | |
| ½ | 1 ½ | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A105 Normalized |
| NIPPLES | | | | |
| ½ | ½ | NIPPLE-THDD/THDD-BS3799 | | ASTM A106 GR.B-SMLS |
| ½ | 1 ½ | NIPPLE-THDD/PE-BS3799 | | ASTM A106 GR.B-SMLS |
| SWAGE NIPPLES | | | | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A234 WPB-SMLS |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 16 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------|-------------------------------------------|------------------------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA03 | | | | |
| | ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| TEE | | | | |
| | ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | 2 | 14 | TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| | 2 | 14 | REDUCING TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| WELDOLET | | | | |
| | 2 | 10 | WELDOLET MSS SP-97 | ASTM A105 Normalized |
| THREADOLET | | | | |
| | ½ | 1 ½ | THREADOLET-THD END-MSS DP-97 | 3000 ASTM A105 Normalized |
| SOCKOLET | | | | |
| | ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 ASTM A105 Normalized |
| FLANGE INSERT | | | | |
| | 1 | 1 ½ | LWN FLANGE | CL.300 RF 125µinch. Ra ASTM A105 Normalized |
| GASKET | | | | |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL150 316S.S+98% GRAPHITE-CS. OUT RING |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL300 316S.S+98% GRAPHITE-CS. OUT RING |
| BOLTS | | | | |
| | ¾ | 4 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | ASTM A193 Gr. B7/A194 Gr.2H |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 17 of 56

| VALVES | | | |
|--------------|-------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size from | to | | Type |
| DA03 | | | |
| ½ | 1 ½ | GV-100 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | GV-101 | Carbon Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL-150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GL-200 | Carbon Steel-Globe-WB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 12 | GL-201 | Carbon Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.150-RF-125µinch.Ra Body Material: ASTM 216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | CH-300 | Carbon Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | CH-301 | Carbon Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GV-104 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800-SW×THDF Body Material: ASTM A105 Normalized Trim Material:13Cr(TRIM No. 8) |
| ½ | 1 1/2 | BL-401 | Carbon Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL. 800- SW with two 100mm nipples Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 2 | 6 | BL-402 | Carbon Steel-Ball-Side Entry-FB-Floating Ball- API608-CL.150- RF-125µinch.Ra Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 8 | 14 | BL-404 | Carbon Steel-Ball-Side Entry-FB-Trunnion Ball-API 608-CL.150- RF-125µinch.Ra Body Material:ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| STRAINER | | | |
| Size from | to | | Type |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 18 of 56

DA05

Service Service Water

Design code: ASME B31.3

Flange Rating/Facing/Face Finishing

| from | to | Code | |
|------|----|------------|------------------------|
| ½ | 14 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|------|-----|-------------|------|--------|-----|
| | Thk | Sch | Fitting Thk | Thk | Sch | Thk |
| ½ | 3.73 | 80 | | 3.73 | 80 | |
| ¾ | 3.91 | 80 | | 3.91 | 80 | |
| 1 | 4.55 | 80 | | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | | 5.08 | 80 | |
| 2 | 3.91 | STD | | 3.91 | 40 | |
| 3 | 5.49 | STD | | | | |
| 4 | 6.02 | STD | | | | |
| 6 | 7.11 | STD | | | | |
| 8 | 7.04 | 30 | | | | |
| 10 | 7.8 | 30 | | | | |
| 12 | 8.38 | 30 | | | | |
| 14 | 9.53 | 30 | | | | |

Fitting Class

| opt. | from | to | Code | SW | THDD | PN |
|------|------|-----|-------------|------|------|----|
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

Corrosion Allowance

| Size | Internal | External |
|--------------|----------|----------|
| from ½ to 14 | 3 | 0 |

Quality Class

| Size | Weld Spec. |
|--------------|-------------------|
| from ½ to 14 | Per Detail Design |

Design Limit

| Temp. | Size up to |
|---------|-----------------|
| °F | 14 |
| -20-100 | Pressure in psi |
| 200 | 285 |
| | 260 |

Note: Ball valves use is limited to 180 °C
Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 19 of 56

DA05

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|--|
| 1/2 | A | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | |

Legend

| | |
|----|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 20 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------------------------------------------------|------------------------|----------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA05 | | | | |
| PIPE | | | | |
| ½ | 1 ½ | PIPE, PE | | ASTM A106 GR.B-SMLS |
| 2 | 14 | PIPE, BE | | ASTM A106 GR.B-SMLS |
| CONNECTION FLANGE | | | | |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| BLIND FLANGE | | | | |
| ½ | 14 | BLIND FLANGE -ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| SPECTACLE BLIND | | | | |
| ½ | 12 | SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| 14 | 14 | BLANK AND SPACER | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| ELBOW | | | | |
| ½ | 1 ½ | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| REDUCER | | | | |
| 2 | 14 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| 2 | 14 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| CAP | | | | |
| ½ | 1 ½ | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | CAP-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| COUPLING | | | | |
| ½ | 1 ½ | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| MALE PLUG | | | | |
| ½ | 1 ½ | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A105 Normalized |
| NIPPLES | | | | |
| ½ | ½ | NIPPLE-THDD/THDD-BS3799 | | ASTM A106 GR.B-SMLS |
| ½ | 1 ½ | NIPPLE-THDD/PE-BS3799 | | ASTM A106 GR.B-SMLS |
| SWAGE NIPPLES | | | | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A234 WPB-SMLS |



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 21 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------|-------------------------------------------|------------------------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA05 | | | | |
| | ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| TEE | | | | |
| | ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | 2 | 14 | TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| | 2 | 14 | REDUCING TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| WELDOLET | | | | |
| | 2 | 10 | WELDOLET MSS SP-97 | ASTM A105 Normalized |
| THREADOLET | | | | |
| | ½ | 1 ½ | THREADOLET-THD END-MSS DP-97 | 3000 ASTM A105 Normalized |
| SOCKOLET | | | | |
| | ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 ASTM A105 Normalized |
| FLANGE INSERT | | | | |
| | 1 | 1 ½ | LWN FLANGE | CL.300 RF 125µinch. Ra ASTM A105 Normalized |
| GASKET | | | | |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL150 316S.S+98% GRAPHITE-CS. OUT RING |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL300 316S.S+98% GRAPHITE-CS. OUT RING |
| BOLTS | | | | |
| | ¾ | 4 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | ASTM A193 Gr. B7/A194 Gr.2H |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 22 of 56

| VALVES | | | |
|--------------|-------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size from | to | | Type |
| DA05 | | | |
| ½ | 1 ½ | GV-100 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | GV-101 | Carbon Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL-150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GL-200 | Carbon Steel-Globe-WB-Red.B-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 12 | GL-201 | Carbon Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.150-RF-125µinch.Ra Body Material: ASTM 216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | CH-300 | Carbon Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | CH-301 | Carbon Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GV-104 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800-SW×THDF Body Material: ASTM A105 Normalized Trim Material:13Cr(TRIM No. 8) |
| ½ | 1 1/2 | BL-401 | Carbon Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL. 800- SW with two 100mm nipples Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 2 | 6 | BL-402 | Carbon Steel-Ball-Side Entry-FB-Floating Ball- API608-CL.150- RF-125µinch.Ra Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 8 | 14 | BL-404 | Carbon Steel-Ball-Side Entry-FB-Trunnion Ball-API 608-CL.150- RF-125µinch.Ra Body Material:ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| STRAINER | | | |
| Size from | to | | Type |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 23 of 56

DA10

Service Service Water

Design code: ASME B31.3

Flange Rating/Facing/Face Finishing

| from | to | Code | |
|------|----|------------|------------------------|
| ½ | 14 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|------|-----|-------------|------|--------|-----|
| | Thk | Sch | Fitting Thk | Thk | Sch | Thk |
| ½ | 3.73 | 80 | | 3.73 | 80 | |
| ¾ | 3.91 | 80 | | 3.91 | 80 | |
| 1 | 4.55 | 80 | | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | | 5.08 | 80 | |
| 2 | 3.91 | STD | | | | |
| 3 | 5.49 | STD | | | | |
| 4 | 6.02 | STD | | | | |
| 6 | 7.11 | STD | | | | |
| 8 | 7.04 | 30 | | | | |
| 10 | 7.8 | 30 | | | | |
| 12 | 8.38 | 30 | | | | |
| 14 | 9.53 | 30 | | | | |

Fitting Class

| opt. | from | to | Code | SW | THDD | PN |
|------|------|-----|-------------|------|------|----|
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

Corrosion Allowance

| Size | Internal | External |
|---------|----------|----------|
| from to | | |
| ½ 14 | 3 | 0 |

Quality Class

| Size | Weld Spec. |
|---------|-------------------|
| from to | Per Detail Design |
| ½ 14 | |

Design Limit

| Temp. | Size up to |
|---------|-----------------|
| | 14 |
| °F | Pressure in psi |
| -20-100 | 285 |
| 200 | 260 |

Note: Ball valves use is limited to 180 °C
Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 24 of 56

DA10

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|--|
| 1/2 | A | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | |

Legend

| | |
|----|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 25 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------------------------------------------------|------------------------|----------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA10 | | | | |
| PIPE | | | | |
| ½ | 1 ½ | PIPE, PE | | ASTM A106 GR.B-SMLS |
| 2 | 14 | PIPE, BE | | ASTM A106 GR.B-SMLS |
| CONNECTION FLANGE | | | | |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| BLIND FLANGE | | | | |
| ½ | 14 | BLIND FLANGE -ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized |
| SPECTACLE BLIND | | | | |
| ½ | 12 | SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| 14 | 14 | BLANK AND SPACER | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 |
| ELBOW | | | | |
| ½ | 1 ½ | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| REDUCER | | | | |
| 2 | 14 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| 2 | 14 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| CAP | | | | |
| ½ | 1 ½ | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | CAP-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| COUPLING | | | | |
| ½ | 1 ½ | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| MALE PLUG | | | | |
| ½ | 1 ½ | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A105 Normalized |
| NIPPLES | | | | |
| ½ | ½ | NIPPLE-THDD/THDD-BS3799 | | ASTM A106 GR.B-SMLS |
| ½ | 1 ½ | NIPPLE-THDD/PE-BS3799 | | ASTM A106 GR.B-SMLS |
| SWAGE NIPPLES | | | | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A234 WPB-SMLS |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 26 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------|-------------------------------------------|------------------------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DA10 | | | | |
| | ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | ASTM A234 WPB-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | ASTM A234 WPB-SMLS |
| TEE | | | | |
| | ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized |
| | 2 | 14 | TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| | 2 | 14 | REDUCING TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS |
| WELDOLET | | | | |
| | 2 | 10 | WELDOLET MSS SP-97 | ASTM A105 Normalized |
| THREADOLET | | | | |
| | ½ | 1 ½ | THREADOLET-THD END-MSS DP-97 | 3000 ASTM A105 Normalized |
| SOCKOLET | | | | |
| | ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 ASTM A105 Normalized |
| FLANGE INSERT | | | | |
| | 1 | 1 ½ | LWN FLANGE | CL.300 RF 125µinch. Ra ASTM A105 Normalized |
| GASKET | | | | |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL150 316S.S+98% GRAPHITE-CS. OUT RING |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL300 316S.S+98% GRAPHITE-CS. OUT RING |
| BOLTS | | | | |
| | ¾ | 4 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | ASTM A193 Gr. B7/A194 Gr.2H |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 27 of 56

| VALVES | | | |
|--------------|-------|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size from | to | | Type |
| DA10 | | | |
| ½ | 1 ½ | GV-100 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | GV-101 | Carbon Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL-150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GL-200 | Carbon Steel-Globe-WB-Red.B-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 12 | GL-201 | Carbon Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.150-RF-125µinch.Ra Body Material: ASTM 216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | CH-300 | Carbon Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | CH-301 | Carbon Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GV-104 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800-SW×THDF Body Material: ASTM A105 Normalized Trim Material:13Cr(TRIM No. 8) |
| ½ | 1 1/2 | BL-401 | Carbon Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL. 800- SW with two 100mm nipples Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 2 | 6 | BL-402 | Carbon Steel-Ball-Side Entry-FB-Floating Ball- API608-CL.150- RF-125µinch.Ra Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 8 | 14 | BL-404 | Carbon Steel-Ball-Side Entry-FB-Trunnion Ball-API 608-CL.150- RF-125µinch.Ra Body Material:ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| STRAINER | | | |
| Size from | to | | Type |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 28 of 56

DJ02

Service **Cooling Water Supply, Cooling Water Return**

Design code: ASME B31.3

| Flange Rating/Facing/Face Finishing | | | |
|-------------------------------------|----|------------|------------------------|
| from | to | Code | |
| ½ | 14 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|------|-----|-------------|------|--------|--|
| | Thk | Sch | Fitting Thk | Thk | Sch | |
| ½ | 2.77 | 40S | | 2.77 | 40S | |
| ¾ | 2.87 | 40S | | 2.87 | 40S | |
| 1 | 3.38 | 40S | | 3.38 | 40S | |
| 1 ½ | 3.68 | 40S | | 3.68 | 40S | |
| 2 | 2.77 | 10S | | | | |
| 3 | 3.05 | 10S | | | | |
| 4 | 3.05 | 10S | | | | |
| 6 | 3.4 | 10S | | | | |
| 8 | 3.76 | 10S | | | | |
| 10 | 4.19 | 10S | | | | |
| 12 | 4.57 | 10S | | | | |
| 14 | 4.78 | 10S | | | | |

| Fitting Class | | | | | | |
|---------------|------|-----|-------------|------|------|----|
| opt. | from | to | Code | SW | THDD | PN |
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

| Corrosion Allowance | | | |
|---------------------|----|----------|----------|
| Size | | Internal | External |
| from | to | | |
| ½ | 14 | 0 | 0 |

| Quality Class | | |
|---------------|----|-------------------|
| Size | | Weld Spec. |
| from | to | Per Detail Design |
| ½ | 14 | |

| Design Limit | |
|--------------|-----------------|
| Temp. | Size up to |
| °F | 14 |
| -20-100 | Pressure in psi |
| 200 | 275 |
| | 230 |

Note: Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 29 of 56

DJ02

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|--|
| 1/2 | A | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | |

| Legend | |
|--------|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 30 of 56

Component/Material descriptions

| Opt. | Size from to | Item | Rating/Facing | Material |
|--------------------------|-----------------|------------------------------------------------|------------------------|---------------------------------|
| DJ02 | | | | |
| PIPE | | | | |
| 1/2 | 1 1/2 | PIPE, PE | | ASTM A312 TP304/304L-SMLS |
| 2 | 6 | PIPE, BE | | ASTM A312 TP304/304L-SMLS |
| 8 | 14 | PIPE, BE | | ASTM A312 TP304/304L-EFW-Ej=0.8 |
| CONNECTION FLANGE | | | | |
| 1/2 | 1 1/2 | SW FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F304/304L |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F304/304L |
| 1/2 | 1 1/2 | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A182 F304/304L |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A182 F304/304L |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F304/304L |
| BLIND FLANGE | | | | |
| 1/2 | 14 | BLIND FLANGE -ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F304/304L |
| SPECTACLE BLIND | | | | |
| 1/2 | 12 | SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A240 304/304L |
| 14 | 14 | BLANK AND SPACER | CL.150 RF 125µinch. Ra | ASTM A240 304/304L |
| ELBOW | | | | |
| 1/2 | 1 1/2 | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A182 F304/304L |
| 2 | 6 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A403 WP304/304LS |
| 8 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 WELDED | | ASTM A403 WP304/304LW |
| 1/2 | 1 1/2 | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A182 F304/304L |
| 2 | 6 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A403 WP304/304LS |
| 8 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 WELDED | | ASTM A403 WP304/304LW |
| REDUCER | | | | |
| 2 | 6 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A403 WP304/304LS |
| 8 | 14 | ECC.REDUCER-ASME B16.9 WELDED | | ASTM A403 WP304/304LW |
| 2 | 6 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A403 WP304/304LS |
| 8 | 14 | CON.REDUCER-ASME B16.9 WELDED | | ASTM A403 WP304/304LW |
| CAP | | | | |
| 1/2 | 1 1/2 | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A182 F304/304L |
| 1/2 | 1 1/2 | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A182 F304/304L |
| 2 | 14 | CAP-ASME B16.9 WELDED | | ASTM A403 WP304/304LS |
| COUPLING | | | | |
| 1/2 | 1 1/2 | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A182 F304/304L |
| 1/2 | 1 1/2 | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A182 F304/304L |
| 1/2 | 1 1/2 | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A182 F304/304L |
| MALE PLUG | | | | |
| 1/2 | 1 1/2 | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A182 F304/304L |
| NIPPLES | | | | |
| 1/2 | 1/2 | NIPPLE-THDD/THDD-BS3799 | | ASTM A312 TP304/304L-SMLS |
| 1/2 | 1 1/2 | NIPPLE-THDD/PE-BS3799 | | ASTM A312 TP304/304L-SMLS |
| SWAGE NIPPLES | | | | |
| 1/2 | 1 1/2 | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A403 WP304/304LS |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 31 of 56

| Component/Material descriptions | | | | | |
|---------------------------------|-----------------|-------------------------------------------|------------------------|----------------------------------|--|
| Opt. | Size from to | Item | Rating/Facing | Material | |
| DJ02 | | | | | |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A403 WP304/304LS | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A403 WP304/304LS | |
| ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | | ASTM A403 WP304/304LS | |
| ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A403 WP304/304LS | |
| ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A403 WP304/304LS | |
| ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A403 WP304/304LS | |
| ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | | ASTM A403 WP304/304LS | |
| TEE | | | | | |
| ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A182 F304/304L | |
| ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A182 F304/304L | |
| 2 | 6 | TEE-ASME B16.9 SMLS | | ASTM A403 WP304/304LS | |
| 8 | 14 | TEE-ASME B16.9 WELDED | | ASTM A403 WP304/304LW | |
| 2 | 6 | REDUCING TEE-ASME B16.9 SMLS | | ASTM A403 WP304/304LS | |
| 8 | 14 | REDUCING TEE-ASME B16.9 WELDED | | ASTM A403 WP304/304LW | |
| WELDOLET | | | | | |
| 2 | 6 | WELDOLET MSS SP-97 | | ASTM A182 F304/304L | |
| THREDOLET | | | | | |
| ½ | 1 ½ | THREDOLET-THD END-MSS DP-97 | 3000 | ASTM A182 F304/304L | |
| SOCKOLET | | | | | |
| ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 | ASTM A182 F304/304L | |
| FLANGE INSERT | | | | | |
| 1 | 1 ½ | LWN FLANGE | CL.300 RF 125µinch. Ra | ASTM A182 F304/304L | |
| GASKET | | | | | |
| ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL150 | 316S.S+98% GRAPHITE-CS. OUT RING | |
| ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL300 | 316S.S+98% GRAPHITE-CS. OUT RING | |
| BOLTS | | | | | |
| ¼ | 6 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | | ASTM A193 Gr. B8/A194 Gr.8 | |



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 32 of 56

| VALVES | | | | |
|--------------|-------|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Size from | to | | Type | |
| DJ02 | | | | |
| ½ | 1 ½ | GV-113 | Stainless Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A182 F304/304L Trim Material:SS316 (TRIM No. 10) | |
| 2 | 14 | GV-114 | Stainless Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL.150-RF-125µinch.Ra Body Material: ASTM A351 CF8 Trim Material: SS316 (TRIM No. 10) | |
| ½ | 1 ½ | GL-208 | Stainless Steel-Globe-WB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A182 F304/304L Trim Material: SS316 (TRIM No. 10) | |
| 2 | 12 | GL-209 | Stainless Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.150-RF-125µinch.Ra Body Material: ASTM A351 CF8 Trim Material: SS316 (TRIM No. 10) | |
| ½ | 1 ½ | CH-309 | Stainless Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A182 F304/304L Trim Material: SS316 (TRIM No. 10) | |
| 2 | 14 | CH-310 | Stainless Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.150-RF-125µinch.Ra Body Material: ASTM A351 CF8 Trim Material: SS316 (TRIM No. 10) | |
| ½ | 1 1/2 | BL-407 | Stainless Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL.150- SW with two 100mm nipples Body Material: ASTM A182 F304/304L Trim Material: Soft seat-316 Ball & Stem-PTFE seat | |
| 2 | 14 | BL-408 | Stainless Steel-Ball-Side Entry-FB-Floating Ball-API 608-CL.150- RF-125µinch.Ra Body Material: ASTM A351 CF8 Trim Material: Soft seat-316 Ball & Stem-PTFE seat | |
| ½ | 1 ½ | GV-115 | Stainless Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800 -SWxTHDF Body Material: ASTM A182 F304/304L Trim Material: SS316 (TRIM No. 10) | |
| STRAINER | | | | |
| Size from | to | | Type | |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A182 F304/304L Trim Material:316-PERF.PLATE-Mesh Size per Detail Design | |
| 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- RF-125µinch.Ra Body Material: ASTM A351 CF8 Trim Material:316-PERF.PLATE-Mesh Size per Detail Design | |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 33 of 56

DL01

Service **DEMIN WATER**

Design code: ASME B31.3

| Flange Rating/Facing/Face Finishing | | | |
|-------------------------------------|----|------------|------------------------|
| from | to | Code | |
| ½ | 14 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|------|-----|-------------|------|--------|--|
| | Thk | Sch | Fitting Thk | Thk | Sch | |
| ½ | 2.77 | 40S | | 2.77 | 40S | |
| ¾ | 2.87 | 40S | | 2.87 | 40S | |
| 1 | 3.38 | 40S | | 3.38 | 40S | |
| 1 ½ | 3.68 | 40S | | 3.68 | 40S | |
| 2 | 2.77 | 10S | | | | |
| 3 | 3.05 | 10S | | | | |
| 4 | 3.05 | 10S | | | | |
| 6 | 3.4 | 10S | | | | |
| 8 | 3.76 | 10S | | | | |
| 10 | 4.19 | 10S | | | | |
| 12 | 4.57 | 10S | | | | |
| 14 | 4.78 | 10S | | | | |

| Fitting Class | | | | | | |
|---------------|------|-----|-------------|------|------|----|
| opt. | from | to | Code | SW | THDD | PN |
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

| Corrosion Allowance | | | |
|---------------------|----|----------|----------|
| Size | | Internal | External |
| from | to | | |
| ½ | 14 | 0 | 0 |

| Quality Class | | |
|---------------|----|-------------------|
| Size | | Weld Spec. |
| from | to | Per Detail Design |
| ½ | 14 | |

| Design Limit | |
|--------------|-----------------|
| Temp. | Size up to |
| °F | 14 |
| | Pressure in psi |
| -20-100 | 275 |
| 200 | 235 |

Note: Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 34 of 56

DL01

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|--|
| 1/2 | A | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | |

| Legend | |
|--------|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 35 of 56

| Component/Material descriptions | | | | | |
|---------------------------------|-----------------|------------------------------------------------|------------------------|---------------------------------|--|
| Opt. | Size from to | Item | Rating/Facing | Material | |
| DL01 | | | | | |
| PIPE | | | | | |
| 1/2 | 1 1/2 | PIPE, PE | | ASTM A312 TP316/316L-SMLS | |
| 2 | 6 | PIPE, BE | | ASTM A312 TP316/316L-SMLS | |
| 8 | 14 | PIPE, BE | | ASTM A312 TP316/316L-EFW-Ej=0.8 | |
| CONNECTION FLANGE | | | | | |
| 1/2 | 1 1/2 | SW FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F316/316L | |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F316/316L | |
| 1/2 | 1 1/2 | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A182 F316/316L | |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A182 F316/316L | |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F316/316L | |
| BLIND FLANGE | | | | | |
| 1/2 | 14 | BLIND FLANGE -ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A182 F316/316L | |
| SPECTACLE BLIND | | | | | |
| 1/2 | 12 | SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A240 316/316L | |
| 14 | 14 | BLANK AND SPACER | CL.150 RF 125µinch. Ra | ASTM A240 316/316L | |
| ELBOW | | | | | |
| 1/2 | 1 1/2 | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| 2 | 6 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A403 WP316/316LS | |
| 8 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 WELDED | | ASTM A403 WP316/316LW | |
| 1/2 | 1 1/2 | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| 2 | 6 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A403 WP316/316LS | |
| 8 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 WELDED | | ASTM A403 WP316/316LW | |
| REDUCER | | | | | |
| 2 | 6 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A403 WP316/316LS | |
| 8 | 14 | ECC.REDUCER-ASME B16.9 WELDED | | ASTM A403 WP316/316LW | |
| 2 | 6 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A403 WP316/316LS | |
| 8 | 14 | CON.REDUCER-ASME B16.9 WELDED | | ASTM A403 WP316/316LW | |
| CAP | | | | | |
| 1/2 | 1 1/2 | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| 1/2 | 1 1/2 | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| 2 | 14 | CAP-ASME B16.9 WELDED | | ASTM A403 WP316/316LS | |
| COUPLING | | | | | |
| 1/2 | 1 1/2 | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| 1/2 | 1 1/2 | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| 1/2 | 1 1/2 | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| MALE PLUG | | | | | |
| 1/2 | 1 1/2 | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A182 F316/316L | |
| NIPPLES | | | | | |
| 1/2 | 1/2 | NIPPLE-THDD/THDD-BS3799 | | ASTM A312 TP316/316L-SMLS | |
| 1/2 | 1 1/2 | NIPPLE-THDD/PE-BS3799 | | ASTM A312 TP316/316L-SMLS | |
| SWAGE NIPPLES | | | | | |
| 1/2 | 1 1/2 | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A403 WP316/316LS | |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 36 of 56

| Component/Material descriptions | | | | | |
|---------------------------------|-----------------|-------------------------------------------|------------------------|----------------------------------|--|
| Opt. | Size from to | Item | Rating/Facing | Material | |
| DL01 | | | | | |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A403 WP316/316LS | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A403 WP316/316LS | |
| ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | | ASTM A403 WP316/316LS | |
| ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A403 WP316/316LS | |
| ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A403 WP316/316LS | |
| ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A403 WP316/316LS | |
| ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | | ASTM A403 WP316/316LS | |
| TEE | | | | | |
| ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A182 F316/316L | |
| 2 | 6 | TEE-ASME B16.9 SMLS | | ASTM A403 WP316/316LS | |
| 8 | 14 | TEE-ASME B16.9 WELDED | | ASTM A403 WP316/316LW | |
| 2 | 6 | REDUCING TEE-ASME B16.9 SMLS | | ASTM A403 WP316/316LS | |
| 8 | 14 | REDUCING TEE-ASME B16.9 WELDED | | ASTM A403 WP316/316LW | |
| WELDOLET | | | | | |
| 2 | 6 | WELDOLET MSS SP-97 | | ASTM A182 F316/316L | |
| THREDOLET | | | | | |
| ½ | 1 ½ | THREDOLET-THD END-MSS DP-97 | 3000 | ASTM A182 F316/316L | |
| SOCKOLET | | | | | |
| ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 | ASTM A182 F316/316L | |
| FLANGE INSERT | | | | | |
| 1 | 1 ½ | LWN FLANGE | CL.300 RF 125µinch. Ra | ASTM A182 F316/316L | |
| GASKET | | | | | |
| ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL150 | 316S.S+98% GRAPHITE-CS. OUT RING | |
| ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL300 | 316S.S+98% GRAPHITE-CS. OUT RING | |
| BOLTS | | | | | |
| ¼ | 6 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | | ASTM A193 Gr. B8M/A194 Gr.8M | |



**Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 37 of 56

| VALVES | | | | |
|-----------------|-------------|-----------|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Size | | | |
| | from | to | Type | |
| DL01 | | | | |
| | ½ | 1 ½ | GV-116 | Stainless Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A182 F316/316L Trim Material:SS316 (TRIM No. 10) |
| | 2 | 14 | GV-117 | Stainless Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL-150-RF-125µinch.Ra Body Material: ASTM A351 CF8M Trim Material: SS316 (TRIM No. 10) |
| | ½ | 1 ½ | GL-211 | Stainless Steel-Globe-WB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A182 F316/316L Trim Material: SS316 (TRIM No. 10) |
| | 2 | 12 | GL-212 | Stainless Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.150-RF-125µinch.Ra Body Material: ASTM A351 CF8M Trim Material: SS316 (TRIM No. 10) |
| | ½ | 1 ½ | CH-312 | Stainless Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A182 F316/316L Trim Material: SS316 (TRIM No. 10) |
| | 2 | 14 | CH-313 | Stainless Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.150-RF-125µinch.Ra Body Material: ASTM A351 CF8M Trim Material: SS316 (TRIM No. 10) |
| | ½ | 1 1/2 | BL-409 | Stainless Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL.150- SW with two 100mm nipples Body Material: ASTM A182 F316/316L Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| | 2 | 14 | BL-410 | Stainless Steel-Ball-Side Entry-FB-Floating Ball-API 608-CL.150- RF-125µinch.Ra Body Material: ASTM A351 CF8M Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| | ½ | 1 ½ | GV-118 | Stainless Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800 -SWxTHDF Body Material: ASTM A182 F316/316L Trim Material: SS316 (TRIM No. 10) |
| STRAINER | | | | |
| | Size | | | |
| | from | to | Type | |
| | ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A182 F316/316L Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| | 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- RF-125µinch.Ra Body Material: ASTM A351 CF8M Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 38 of 56

DQ01

Service Potable Water, Instrument Air

Design code: ASME B31.3

| Flange Rating/Facing/Face Finishing | | | |
|-------------------------------------|----|------------|------------------------|
| from | to | Code | |
| ½ | 6 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 6 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe Thickness | | Fitting Thk | Nipple | |
|------|----------------|-----|-------------|--------|-----|
| | Thk | Sch | | Thk | Sch |
| ½ | 3.73 | 80 | 3.73 | 80 | |
| ¾ | 3.91 | 80 | 3.91 | 80 | |
| 1 | 4.55 | 80 | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | 5.08 | 80 | |
| 2 | 3.91 | STD | | | |
| 3 | 5.49 | STD | | | |
| 4 | 6.02 | STD | | | |
| 6 | 7.11 | STD | | | |

| Fitting Class | | | | | |
|---------------|------|-----|-------------|----|------|
| opt. | from | to | Code | SW | THDD |
| | ½ | 1 ½ | ASME B16.11 | | 3000 |

| Corrosion Allowance | | | |
|---------------------|------|----|----------|
| Size | from | to | Internal |
| | | | External |
| ½ | 6 | | 1.6 |
| | | | 0 |

| Quality Class | | |
|---------------|------------|-------------------|
| Size | Weld Spec. | |
| from ½ | to 6 | Per Detail Design |

| Design Limit | |
|--------------|-----------------|
| Temp. | Size up to |
| °F | 6 |
| -20-100 | Pressure in psi |
| 200 | 285 |
| | 260 |

Note: Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.

For 6" piping prefabricated spools shall be constructed in site and then shall be sent to Hot Dip Galvanizing shop before installation. So, flanged spools shall be considered in piping design to be hot dip galvanized in site.



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 39 of 56

DQ01

Branch Connection 90 Degree

| Run Size | Branch Size | | | | | | |
|----------|-------------|---|---|---|---|---|---|
| 1/2 | A | | | | | | |
| 3/4 | A | A | | | | | |
| 1 | A | A | A | | | | |
| 1 1/2 | A | A | A | A | | | |
| 2 | S | S | S | S | T | | |
| 3 | S | S | S | S | T | T | |
| 4 | S | S | S | S | T | T | T |

| Legend | |
|--------|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 40 of 56

| Component/Material descriptions | | | | | |
|---------------------------------|-----------|----|-----------------------------------------|------------------------|----------------------------------|
| Opt. | Size from | to | Item | Rating/Facing | Material |
| DQ01 | | | | | |
| PIPE | | | | | |
| | ½ | 4 | PIPE +1 COUPLING-NPT ENDS | | ASTM A53 GR.B-Hot Dip GALV.-SMLS |
| | 6 | 6 | PIPE BE | | ASTM A53 GR.B SMLS |
| CONNECTION FLANGE | | | | | |
| | ½ | 4 | THDD FLANGE-ASME B16.5 | CL.150 FF 125µinch. Ra | ASTM A105 Hot Dip GALV |
| | 6 | 6 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 |
| BLIND FLANGE | | | | | |
| | ½ | 6 | BLIND FLANGE -ASME B16.5 | CL.150 FF 125µinch. Ra | ASTM A105 Hot Dip GALV |
| SPECTACLE BLIND | | | | | |
| | 1 | 6 | SPECIAL SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 Hot Dip GALV. |
| ELBOW | | | | | |
| | ½ | 4 | ELBOW 45° -THD ENDS-ASME B16.11 | 3000 | ASTM A105 Hot Dip GALV. |
| | 6 | 6 | ELBOW 45° -BE ENDS-ASME B16.9 | | ASTM A234-WPB |
| | ½ | 4 | ELBOW 90°-THD ENDS-ASME B16.11 | 3000 | ASTM A105 Hot Dip GALV. |
| | 6 | 6 | ELBOW 90°-BE ENDS-ASME B16.9 | | ASTM A234-WPB |
| REDUCER | | | | | |
| | ½ | 4 | ECC.RED. COUPLING THD END -ASME B16.11 | | ASTM A105 Hot Dip GALV. |
| | 6 | 6 | ECC.RED. COUPLING BE END -ASME B16.9 | | ASTM A234-WPB |
| | ½ | 4 | CON. RED. COUPLING THD END -ASME B16.11 | | ASTM A105 Hot Dip GALV. |
| | 6 | 6 | CON. RED. COUPLING BE END -ASME B16.9 | | ASTM A234-WPB |
| CAP | | | | | |
| | ½ | 4 | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A105 Hot Dip GALV. |
| | 6 | 6 | CAP-BE END-ASME B16.9 | | ASTM A234-WPB |
| COUPLING | | | | | |
| | ½ | 4 | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A105 Hot Dip GALV. |
| MALE PLUG | | | | | |
| | ½ | 4 | THD MALE PLUG-HEX. HEAD-ASME B16.11 | | ASTM A105 Hot Dip GALV. |
| NIPPLES | | | | | |
| | ½ | 4 | NIPPLE-THDD/THDD-BS3799 | | ASTM A53 GR.B-Hot Dip GALV.-SMLS |
| SWAGE NIPPLES | | | | | |
| | ½ | 4 | ECC.SWAGE NIPPLE-THDD/THDD-MSS SP-95 | | ASTM A234 WPB Hot Dip GALV.-SMLS |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/THDD-MSS SP-95 | | ASTM A234 WPB Hot Dip GALV.-SMLS |
| TEE | | | | | |
| | ½ | 4 | FEMALE TEE-THD ENDS-ASME B16.11 | 3000 | ASTM A105 Hot Dip GALV. |
| | 6 | 6 | EQUAL TEE-BE ENDS-ASME B16.9 | | ASTM A234-WPB |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 41 of 56

| Component/Material descriptions | | | | | |
|---------------------------------|--------------|----|-------------------------------------------|---------------|-----------------------------|
| Opt. | Size from | to | Item | Rating/Facing | Material |
| DQ01 | | | | | |
| | ½ | 4 | REDUCING FEMALE TEE-THDD ENDS-ASME B16.11 | 3000 | ASTM A105 Hot Dip GALV. |
| | 6 | 6 | REDUCING TEE-BE ENDS-ASME B16.9 | | ASTM A234-WPB |
| THREDOLET | | | | | |
| | ½ | 4 | THREDOLET-THD END-MSS DP-97 | 3000 | ASTM A105 Hot Dip GALV. |
| GASKET | | | | | |
| | ½ | 6 | FULL FACE NON- METTALIC GASKET | | NEOPRENE |
| BOLTS | | | | | |
| | ¼ | 6 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASME Thdd | | ASTM A193 Gr. B7/A194 Gr.2H |

| VALVES | | | | | |
|---------------|--------------|----|--------|---------------------------------------------------------------------------------------------------------------------------------------|--|
| Pos. | Size from | to | Item | Type | |
| 2 | 1/2 | 6 | GV-102 | Bronze-Gate-BB-FB-Flexible Wedge-Thdd Seat-MSS SP-80 - CL-150-FF-125µinch.Ra Body Material:ASTM B62 C83600 Trim Material:Bronze | |
| 4 | ½ | 6 | GL-202 | Bronze -Globe-BB-Swivel Plug-Thdd Seat-MSS SP-80- CL-150-FF-125µinch.Ra Body Material: ASTM B62 C83600 Trim Material: Bronze | |
| 6 | 1/2 | 6 | CH-302 | Bronze -Check-BB-FB-Swing-Thdd Seat-MSS SP-80- CL.150-FF-125µinch.Ra Body Material: ASTM B62 C83600 Trim Material: Bronze | |

| STRAINER | | | | | |
|-----------------|--------------|----|------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Pos. | Size from | to | Item | Type | |
| 1 | 1/2 | 6 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- FF-125µinch.Ra Body Material:ASTM B62 C83600 Trim Material:316-PERF.PLATE-18 Holes/ Cm² | |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 42 of 56

DZ01

Service Chemical Sewer, Oily Sewer, Sanitary Sewer

Design code: ASME B31.3

Flange Rating/Facing/Face Finishing

| from | to | Code | |
|------|----|------------|------------------------|
| ½ | 14 | ASME B16.5 | CL.150 RF 125µinch. Ra |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|------|-----|-------------|------|--------|-----|
| | Thk | Sch | Fitting Thk | Thk | Sch | Thk |
| ½ | 3.73 | 80 | | 3.73 | 80 | |
| ¾ | 3.91 | 80 | | 3.91 | 80 | |
| 1 | 4.55 | 80 | | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | | 5.08 | 80 | |
| 2 | 3.91 | STD | | | | |
| 3 | 5.49 | STD | | | | |
| 4 | 6.02 | STD | | | | |
| 6 | 7.11 | STD | | | | |
| 8 | 7.04 | 30 | | | | |
| 10 | 7.8 | 30 | | | | |
| 12 | 8.38 | 30 | | | | |
| 14 | 9.53 | 30 | | | | |

Fitting Class

| opt. | from | to | Code | SW | THDD | PN |
|------|------|-----|-------------|------|------|----|
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

Corrosion Allowance

| Size | Internal | External |
|--------------|----------|----------|
| from ½ to 14 | 3 | 0 |

Quality Class

| Size | Weld Spec. |
|--------------|-------------------|
| from ½ to 14 | Per Detail Design |

Design Limit

| Temp. | Size up to |
|---------|-----------------|
| °F | 14 |
| -20-100 | Pressure in psi |
| 200 | 285 |
| | 260 |

Note: Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.
 Pipes shall be shop 3LPE Coated and Fitting and Flanges shall be shop Dual FBE Coated.



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 43 of 56

DZ01

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|--|
| 1/2 | A | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | |

Legend

| | |
|----|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 44 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------------------------------------------------|------------------------|-----------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DZ01 | | | | |
| PIPE | | | | |
| ½ | 1 ½ | PIPE, PE | | ASTM A106 GR.B-SMLS 3LPE COATED |
| 2 | 14 | PIPE, BE | | ASTM A106 GR.B-SMLS 3LPE COATED |
| CONNECTION FLANGE | | | | |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized DUAL FBE CO. |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized DUAL FBE CO. |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized DUAL FBE CO. |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized DUAL FBE CO. |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized DUAL FBE CO. |
| BLIND FLANGE | | | | |
| ½ | 14 | BLIND FLANGE -ASME B16.5 | CL.150 RF 125µinch. Ra | ASTM A105 Normalized DUAL FBE CO. |
| SPECTACLE BLIND | | | | |
| ½ | 12 | SPECTACLE BLIND | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 DUAL FBE CO. |
| 14 | 14 | BLANK AND SPACER | CL.150 RF 125µinch. Ra | ASTM A515 Gr.70 DUAL FBE CO. |
| ELBOW | | | | |
| ½ | 1 ½ | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized DUAL FBE CO. |
| 2 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS DUAL FBE CO. |
| ½ | 1 ½ | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized DUAL FBE CO. |
| 2 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS DUAL FBE CO. |
| REDUCER | | | | |
| 2 | 14 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS DUAL FBE CO. |
| 2 | 14 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS DUAL FBE CO. |
| CAP | | | | |
| ½ | 1 ½ | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized DUAL FBE CO. |
| ½ | 1 ½ | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A105 Normalized DUAL FBE CO. |
| 2 | 14 | CAP-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS DUAL FBE CO. |
| COUPLING | | | | |
| ½ | 1 ½ | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized DUAL FBE CO. |
| ½ | 1 ½ | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized DUAL FBE CO. |
| ½ | 1 ½ | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized DUAL FBE CO. |
| MALE PLUG | | | | |
| ½ | 1 ½ | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A105 Normalized |
| NIPPLES | | | | |
| ½ | ½ | NIPPLE-THDD/THDD-BS3799 | | ASTM A106 GR.B-SMLS DUAL FBE CO. |
| ½ | 1 ½ | NIPPLE-THDD/PE-BS3799 | | ASTM A106 GR.B-SMLS DUAL FBE CO. |
| SWAGE NIPPLES | | | | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WPB-SMLS DUAL FBE CO. |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WPB-SMLS DUAL FBE CO. |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A234 WPB-SMLS DUAL FBE CO. |



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 45 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------|-------------------------------------------|-------------------------------------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| DZ01 | | | | |
| | ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | ASTM A234 WPB-SMLS DUAL FBE CO. |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | ASTM A234 WPB-SMLS DUAL FBE CO. |
| | ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | ASTM A234 WPB-SMLS DUAL FBE CO. |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | ASTM A234 WPB-SMLS DUAL FBE CO. |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | ASTM A234 WPB-SMLS DUAL FBE CO. |
| TEE | | | | |
| | ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized DUAL FBE CO. |
| | ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 ASTM A105 Normalized DUAL FBE CO. |
| | 2 | 14 | TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS DUAL FBE CO. |
| | 2 | 14 | REDUCING TEE-ASME B16.9 SMLS | ASTM A234 WPB-SMLS DUAL FBE CO. |
| WELDOLET | | | | |
| | 2 | 10 | WELDOLET MSS SP-97 | ASTM A105 Normalized DUAL FBE CO. |
| THREDOLET | | | | |
| | ½ | 1 ½ | THREDOLET-THD END-MSS DP-97 | 3000 ASTM A105 Normalized DUAL FBE CO. |
| SOCKOLET | | | | |
| | ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 ASTM A105 Normalized DUAL FBE CO. |
| FLANGE INSERT | | | | |
| | 1 | 1 ½ | LWN FLANGE | CL.300 RF 125µinch. Ra ASTM A105 Normalized DUAL FBE CO. |
| GASKET | | | | |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL.150 316S.S+98% GRAPHITE-CS. OUT RING |
| BOLTS | | | | |
| | ¼ | 4 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | ASTM A193 Gr. B7/A194 Gr.2H |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 46 of 56

| VALVES | | | |
|--------------|-----|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size from | to | | Type |
| DZ01 | | | |
| ½ | 1 ½ | GV-100 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | GV-101 | Carbon Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL-150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GL-200 | Carbon Steel-Globe-WB-Red.B-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 12 | GL-201 | Carbon Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.150-RF-125µinch.Ra Body Material: ASTM 216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | CH-300 | Carbon Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | CH-301 | Carbon Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.150-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GV-104 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800-SW×THDF Body Material: ASTM A105 Normalized Trim Material:13Cr(TRIM No. 8) |
| STRAINER | | | |
| Size from | to | | Type |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.150- RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 47 of 56

EA01

Service Natural Gas, Fuel Gas

Design code: ASME B31.3

Flange Rating/Facing/Face Finishing

| | | | |
|-------------|-----------|-------------|------------------------|
| from | to | Code | |
| ½ | 14 | ASME B16.5 | CL.300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|------|-----|-------------|------|--------|-----|
| | Thk | Sch | Fitting Thk | Thk | Sch | Thk |
| ½ | 3.73 | 80 | | 3.73 | 80 | |
| ¾ | 3.91 | 80 | | 3.91 | 80 | |
| 1 | 4.55 | 80 | | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | | 5.08 | 80 | |
| 2 | 3.91 | STD | | | | |
| 3 | 5.49 | STD | | | | |
| 4 | 6.02 | STD | | | | |
| 6 | 7.11 | STD | | | | |
| 8 | 7.04 | 30 | | | | |
| 10 | 7.8 | 30 | | | | |
| 12 | 8.38 | 30 | | | | |
| 14 | 9.53 | 30 | | | | |

Fitting Class

| | | | | | | |
|-------------|-------------|-----------|-------------|-----------|-------------|-----------|
| opt. | from | to | Code | SW | THDD | PN |
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

| Size | from | to | Corrosion Allowance | |
|------|------|-----|---------------------|----------|
| | | | Internal | External |
| ½ | 14 | 1.5 | 0 | |

| Size | from | to | Quality Class | |
|------|------|----|---------------|-------------------|
| | | | Weld Spec. | Per Detail Design |
| ½ | 14 | | | |

Design Limit

| Temp. | Size up to |
|---------|-----------------|
| °F | 14 |
| -20-100 | Pressure in psi |
| | 740 |
| 200 | 680 |

Note: Ball valves use is limited to 180 °C
 Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 48 of 56

EA01

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|--|
| 1/2 | A | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | |

Legend

| | |
|----|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 49 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------------------------------------------------|------------------------|----------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| EA01 | | | | |
| PIPE | | | | |
| ½ | 1 ½ | PIPE, PE | | ASTM A106 GR.B-SMLS |
| 2 | 14 | PIPE, BE | | ASTM A106 GR.B-SMLS |
| CONNECTION FLANGE | | | | |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 2 | 14 | WN FLANGE-ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| 12 | 14 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| BLIND FLANGE | | | | |
| ½ | 14 | BLIND FLANGE -ASME B16.5 | CL.300 RF 125µinch. Ra | ASTM A105 Normalized |
| SPECTACLE BLIND | | | | |
| ½ | 12 | SPECTACLE BLIND | CL.300 RF 125µinch. Ra | ASTM A515 Gr.70 |
| 14 | 14 | BLANK AND SPACER | CL.300 RF 125µinch. Ra | ASTM A515 Gr.70 |
| ELBOW | | | | |
| ½ | 1 ½ | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| REDUCER | | | | |
| 2 | 14 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| 2 | 14 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| CAP | | | | |
| ½ | 1 ½ | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| 2 | 14 | CAP-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| COUPLING | | | | |
| ½ | 1 ½ | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| ½ | 1 ½ | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A105 Normalized |
| MALE PLUG | | | | |
| ½ | 1 ½ | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A105 Normalized |
| NIPPLES | | | | |
| ½ | ½ | NIPPLE-THDD/THDD-BS3799 | | ASTM A106 GR.B-SMLS |
| ½ | 1 ½ | NIPPLE-THDD/PE-BS3799 | | ASTM A106 GR.B-SMLS |
| SWAGE NIPPLES | | | | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WPB-SMLS |
| ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WPB-SMLS |



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 50 of 56

| Component/Material descriptions | | | | | |
|---------------------------------|--------------|------|-------------------------------------------|------------------------|----------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material | |
| EA01 | | | | | |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | ASTM A234 WPB-SMLS | |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | ASTM A234 WPB-SMLS | |
| TEE | | | | | |
| | ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| | ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A105 Normalized |
| | 2 | 14 | TEE-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| | 2 | 14 | REDUCING TEE-ASME B16.9 SMLS | | ASTM A234 WPB-SMLS |
| WELDOLET | | | | | |
| | 2 | 10 | WELDOLET MSS SP-97 | | ASTM A105 Normalized |
| THREADOLET | | | | | |
| | ½ | 1 ½ | THREADOLET-THD END-MSS DP-97 | 3000 | ASTM A105 Normalized |
| SOCKOLET | | | | | |
| | ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 | ASTM A105 Normalized |
| FLANGE INSERT | | | | | |
| | 1 | 1 ½ | LWN FLANGE | CL.300 RF 125punch. Ra | ASTM A105 Normalized |
| GASKET | | | | | |
| | ½ | 14 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL.300 | 316S.S+98% GRAPHITE-CS. OUT RING |
| BOLTS | | | | | |
| | ¼ | 4 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | | ASTM A193 Gr. B7/A194 Gr.2H |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 51 of 56

| VALVES | | | |
|--------------|-----|--------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size from | to | | Type |
| EA01 | | | |
| ½ | 1 ½ | GV-100 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | GV-122 | Carbon Steel-Gate-BB-FB-Flexible Wedge-Thdd Seat-API 600- CL-300-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GL-200 | Carbon Steel-Globe-WB-Red.B Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 12 | GL-210 | Carbon Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.300-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | CH-300 | Carbon Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 14 | CH-311 | Carbon Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.300-RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GV-104 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800-SW×THDF Body Material: ASTM A105 Normalized Trim Material:13Cr(TRIM No. 8) |
| ½ | 1 ½ | BL-401 | Carbon Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL. 800- SW with two 100mm nipples Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 2 | 6 | BL-405 | Carbon Steel-Ball-Side Entry-FB-Floating Ball- API608-CL.300- RF-125µinch.Ra Body Material: ASTM A105 Normalized/ ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 8 | 14 | BL-406 | Carbon Steel-Ball-Side Entry-FB-Trunnion Ball-API 608-CL.300- RF-125µinch.Ra Body Material:ASTM A216 WCB Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| STRAINER | | | |
| Size from | to | | Type |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A105 Normalized Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| 2 | 14 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.300- RF-125µinch.Ra Body Material: ASTM A216 WCB Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 52 of 56

GD01

Service High Pressure Steam

Design code: ASME B31.3

Flange Rating/Facing/Face Finishing

| from | to | Code | |
|------|----|------------|-----------------------|
| ½ | 18 | ASME B16.5 | CL300 RF 125µinch. Ra |

| Size | Pipe | | Thickness | | Nipple | |
|------|-------|-----|-------------|------|--------|-----|
| | Thk | Sch | Fitting Thk | Thk | Sch | Thk |
| ½ | 3.73 | 80 | | 3.73 | 80 | |
| ¾ | 3.91 | 80 | | 3.91 | 80 | |
| 1 | 4.55 | 80 | | 4.55 | 80 | |
| 1 ½ | 5.08 | 80 | | 5.08 | 80 | |
| 2 | 5.54 | XS | | | | |
| 3 | 7.62 | XS | | | | |
| 4 | 8.56 | XS | | | | |
| 6 | 10.97 | XS | | | | |
| 8 | 12.70 | XS | | | | |
| 10 | 15.09 | 80 | | | | |
| 12 | 17.48 | 80 | | | | |
| 14 | 19.05 | 80 | | | | |
| 16 | 21.44 | 80 | | | | |
| 18 | 23.83 | 80 | | | | |

Fitting Class

| opt. | from | to | Code | SW | THDD | PN |
|------|------|-----|-------------|------|------|----|
| | ½ | 1 ½ | ASME B16.11 | 3000 | 3000 | |

| Size | Corrosion Allowance | | |
|--------|---------------------|----------|---|
| | Internal | External | |
| from ½ | to 18 | 1.5 | 0 |

| Quality Class | | Weld Spec. |
|---------------|------------|-------------------|
| Size | Weld Spec. | |
| from ½ | to 18 | Per Detail Design |

Design Limit

| Temp. | Size up to |
|---------|-----------------|
| | 18 |
| °F | Pressure in psi |
| -20-100 | 1500 |
| 200 | 1500 |
| 300 | 1445 |
| 400 | 1385 |
| 500 | 1330 |
| 600 | 1210 |
| 650 | 1175 |
| 700 | 1135 |
| 800 | 1015 |
| 900 | 900 |

Note: Flanges welding neck/ Socket weld and butt welding fittings have the same thickness of relevant pipe.



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 53 of 56

GD01

Branch Connection 90 Degree

| Run Size | | | | | | | | | | | | | | | | |
|-------------|-----|-----|---|-------|---|---|---|---|---|----|----|----|----|----|--|--|
| 1/2 | A | | | | | | | | | | | | | | | |
| 3/4 | A | A | | | | | | | | | | | | | | |
| 1 | A | A | A | | | | | | | | | | | | | |
| 1 1/2 | A | A | A | A | | | | | | | | | | | | |
| 2 | S | S | S | S | T | | | | | | | | | | | |
| 3 | S | S | S | S | T | T | | | | | | | | | | |
| 4 | S | S | S | S | T | T | T | | | | | | | | | |
| 6 | S | S | S | S | W | T | T | T | | | | | | | | |
| 8 | S | S | S | S | W | W | T | T | T | | | | | | | |
| 10 | S | S | S | S | W | W | W | T | T | T | | | | | | |
| 12 | S | S | S | S | W | W | W | T | T | T | T | | | | | |
| 14 | S | S | S | S | W | W | W | W | T | T | T | T | | | | |
| 16 | S | S | S | S | W | W | W | W | T | T | T | T | T | | | |
| 18 | S | S | S | S | W | W | W | W | W | T | T | T | T | T | | |
| Branch Size | 1/2 | 3/4 | 1 | 1 1/2 | 2 | 3 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | | |

| Legend | |
|--------|--------------------------------|
| A | TEE- SW ENDS-ASME B16.11 |
| P | PIPE TO PIPE |
| S | SOCKOLET SW END-MSS SP97 |
| T | TEE-ASME B16.9 |
| W | WELDOLET-MSS SP95 |
| PR | PIPE TP PIPE WITH REINFORCMENT |



Toase-eh Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 54 of 56

| Component/Material descriptions | | | | |
|---------------------------------|--------------|------------------------------------------------|------------------------|-----------------------|
| Opt. | Size from to | Item | Rating/Facing | Material |
| GD01 | | | | |
| PIPE | | | | |
| ½ | 1 ½ | PIPE, PE | | ASTM A335 GR.P11-SMLS |
| 2 | 18 | PIPE, BE | | ASTM A335 GR.P11-SMLS |
| CONNECTION FLANGE | | | | |
| ½ | 1 ½ | SW FLANGE-ASME B16.5 | CL.600 RF 125µinch. Ra | ASTM A182 GR.F11 CL.2 |
| 2 | 18 | WN FLANGE-ASME B16.5 | CL.600 RF 125µinch. Ra | ASTM A182 GR.F11 CL.2 |
| 12 | 18 | Spec. MOD. WN FLANGE-w/t JACKSCREW- ASME B16.5 | CL.600 RF 125µinch. Ra | ASTM A182 GR.F11 CL.2 |
| BLIND FLANGE | | | | |
| ½ | 18 | BLIND FLANGE -ASME B16.5 | CL.600 RF 125µinch. Ra | ASTM A182 GR.F11 CL.2 |
| SPECTACLE BLIND | | | | |
| ½ | 12 | SPECTACLE BLIND | CL.600 RF 125µinch. Ra | ASTM A387 Gr.11 |
| 14 | 18 | BLANK AND SPACER | CL.600 RF 125µinch. Ra | ASTM A387 Gr.11 |
| ELBOW | | | | |
| ½ | 1 ½ | ELBOW 45° -SW ENDS-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| 2 | 18 | LONG RADIOUS ELBOW 45°-ASME B16.9 SMLS | | ASTM A234 WP11-SMLS |
| ½ | 1 ½ | ELBOW 90°-SW ENDS-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| 2 | 18 | LONG RADIOUS ELBOW 90°-ASME B16.9 SMLS | | ASTM A234 WP11-SMLS |
| REDUCER | | | | |
| 2 | 18 | ECC.REDUCER-ASME B16.9 SMLS | | ASTM A234 WP11-SMLS |
| 2 | 18 | CON.REDUCER-ASME B16.9 SMLS | | ASTM A234 WP11-SMLS |
| CAP | | | | |
| ½ | 1 ½ | FEMALE CAP-SW END-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| ½ | 1 ½ | FEMALE CAP-THD END-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| 2 | 18 | CAP-ASME B16.9 SMLS | | ASTM A234 WP11-SMLS |
| COUPLING | | | | |
| ½ | 1 ½ | COUPLING-SW/THDD END-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| ½ | 1 ½ | COUPLING-SW END-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| ½ | 1 ½ | COUPLING-THDD END-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| MALE PLUG | | | | |
| ½ | 1 ½ | THD MALE PLUG-RND HEAD-ASME B16.11 | | ASTM A182 GR.F11 CL.2 |
| NIPPLES | | | | |
| ½ | ½ | NIPPLE-THDD/THDD-BS3799 | | ASTM A106 GR.B-SMLS |
| ½ | 1 ½ | NIPPLE-THDD/PE-BS3799 | | ASTM A106 GR.B-SMLS |
| SWAGE NIPPLES | | | | |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WP11-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WP11-SMLS |
| ½ | 1 ½ | ECC.SWAGE NIPPLE-PE/THDD-MSS SP-95 | | ASTM A234 WP11-SMLS |
| ½ | 4 | ECC.SWAGE NIPPLE- THDD/BE -MSS SP-95 | | ASTM A234 WP11-SMLS |
| ½ | 1 ½ | CON.SWAGE NIPPLE-PE/PE-MSS SP-95 | | ASTM A234 WP11-SMLS |
| ½ | 4 | CON.SWAGE NIPPLE-PE/BE-MSS SP-95 | | ASTM A234 WP11-SMLS |



Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
**CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
 STYRENE PARK OFFSITE**



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R3

Page 55 of 56

| Component/Material descriptions | | | | | |
|---------------------------------|--------------|------|-------------------------------------------|------------------------|----------------------------------|
| Opt. | Size from to | Item | Rating/Facing | Material | |
| GD01 | | | | | |
| | ½ | 1 ½ | CON.SWAGE NIPPLE-PE/THDD-MSS SP-95 | ASTM A234 WP11-SMLS | |
| | ½ | 4 | CON.SWAGE NIPPLE-THDD/BE-MSS SP-95 | ASTM A234 WP11-SMLS | |
| TEE | | | | | |
| | ½ | 1 ½ | FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| | ½ | 1 ½ | REDUCING FEMALE TEE-SW ENDS-ASME B16.11 | 3000 | ASTM A182 GR.F11 CL.2 |
| | 2 | 18 | TEE-ASME B16.9 SMLS | | ASTM A234 WP11-SMLS |
| | 2 | 18 | REDUCING TEE-ASME B16.9 SMLS | | ASTM A234 WP11-SMLS |
| WELDOLET | | | | | |
| | 2 | 10 | WELDOLET MSS SP-97 | | ASTM A182 GR.F11 CL.2 |
| THREDOLET | | | | | |
| | ½ | 1 ½ | THREDOLET-THD END-MSS DP-97 | 3000 | ASTM A182 GR.F11 CL.2 |
| SOCKOLET | | | | | |
| | ½ | 1 ½ | SOCKOLET-SW END-MSS SP-97 | 3000 | ASTM A182 GR.F11 CL.2 |
| FLANGE INSERT | | | | | |
| | 1 | 1 ½ | LWN FLANGE | CL.600 RF 125punch. Ra | ASTM A182 GR.F11 CL.2 |
| GASKET | | | | | |
| | ½ | 18 | SPIRAL WOUND GASKTE-With OUT & INNER RING | CL.600 | 316S.S+98% GRAPHITE-CS. OUT RING |
| BOLTS | | | | | |
| | ¼ | 4 | HEXAGONAL HEAVY STUD BOLT+2 NUT-ASMETHdd | | ASTM A193 Gr. B16/A194 Gr.16 |



پتروشیمی توسعه پارک
صنعتی گوهر افق

Toase-ehe Park Sanati Gohar Ofogh Petrochemical Co.
CONCEPTUAL, BASIC and DETAIL DESIGN ENGINEERING OF
STYRENE PARK OFFSITE



BINA Consulting Eng. Co.

Document Title: PIPING MATERIAL SPECIFICATION

Document Number: EI027-000-EB-PI-SPC-002

Rev.R2

Page 56 of 56

| VALVES | | | |
|--------------|-----|--------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Size from | to | | Type |
| GD01 | | | |
| ½ | 1 ½ | GV-119 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL.800-SW Body Material: ASTM A182 F11 CL.2 Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 18 | GV-120 | Carbon Steel-Gate-BB-FB-Flexible Wedge-Thd Seat-API 600- CL-600-RF-125µinch.Ra Body Material: ASTM A217 WC6 Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GL-220 | Carbon Steel-Globe-WB-Red.B Thdd Seat-API 602-CL.800-SW Body Material: ASTM A182 F11 CL.2 Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 12 | GL-221 | Carbon Steel-Globe-BB-Swivel Plug-Thdd Seat-BS1873- CL.600-RF-125µinch.Ra Body Material: ASTM A217 WC6 Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | CH-320 | Carbon Steel-Check-BB-Red.B-Piston-Thdd Seat-API 602-CL.800-SW Body Material: ASTM A182 F11 CL.2 Trim Material:13Cr/HF (TRIM No. 8) |
| 2 | 18 | CH-321 | Carbon Steel-Check-BB-FB-Swing-Thdd Seat-BS1868- CL.600-RF-125µinch.Ra Body Material: ASTM A217 WC6 Trim Material:13Cr/HF (TRIM No. 8) |
| ½ | 1 ½ | GV-121 | Carbon Steel-Gate-WB-Red.B-Solid Wedge-Exp. Seat-API 602-CL800-SW×THDF Body Material: ASTM A182 F11 CL.2 Trim Material:13Cr(TRIM No. 8) |
| ½ | 1 ½ | BL-420 | Carbon Steel-Ball- Single Piece-FB-Floating Ball-ISO 17292-CL. 800- SW with two 100mm nipples Body Material: ASTM A182 F11 CL.2 Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 2 | 6 | BL-421 | Carbon Steel-Ball-Side Entry-FB-Floating Ball- API608-CL.600- RF-125µinch.Ra Body Material: ASTM A217 WC6 Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| 8 | 18 | BL-422 | Carbon Steel-Ball-Side Entry-FB-Trunnion Ball-API 608-CL.600- RF-125µinch.Ra Body Material:ASTM A217 WC6 Trim Material: Soft seat-316 Ball & Stem-PTFE seat |
| STRAINER | | | |
| Size from | to | | Type |
| ½ | 1 ½ | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34-CL.800-SW Body Material: ASTM A182 F11 CL.2 Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |
| 2 | 18 | | Carbon steel-Y Strainer-Bolted Cover-ASME B16.34- CL.600- RF-125µinch.Ra Body Material: ASTM A217 WC6 Trim Material:316-PERF.PLATE-Mesh Size per Detail Design |