



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض

احداث خطوط انتقال گاز/مایعات گازی از ایستگاه تقویت فشار گاز
بینک تا ایستگاه تزریق گاز سیاهمکان/واحد بهره برداری بینک



شماره پیمان:

PIPELINE MATERIAL SPECIFICATION

شماره صفحه: ۱ از ۱۴

۰۵۳ - ۰۷۳ - ۹۱۸۴

| نسخه | سریال | نوع مدرک | رشته | تسهیلات | صادرکننده | بسته کاری | پروژه |
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| D03 | 0001 | SP | PL | 320 | PEDCO | PPL | BK |

طرح نگهداشت و افزایش تولید ۲۷ مخزن

PIPELINE MATERIAL SPECIFICATION

نگهداشت و افزایش تولید میدان نفتی بینک

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Status:

IDC: Inter-Discipline Check
 IFC: Issued For Comment
 IFA: Issued For Approval
 AFD: Approved For Design
 AFC: Approved For Construction
 AFP: Approved For Purchase
 AFQ: Approved For Quotation
 IFI: Issued For Information
 AB-R: As-Built for CLIENT Review
 AB-A: As-Built -Approved



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REVISION RECORD SHEET

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1.0 INTRODUCTION

Binak oilfield in Bushehr province is a part of the southern oilfields of Iran, is located 20 km northwest of Genaveh city.

With the aim of increasing production of oil from Binak oilfield, an EPC/EPD Project has been defined by NIOC/NISOC and awarded to Petro Iran Development Company (PEDCO). Also PEDCO (as General Contractor) has assigned the EPC-packages of the Project to "Hirgan Energy - Design and Inspection" JV.

As a part of the Project, New Gas/Condensate Pipelines (from Binak New GCS to Siahmakan GIS/Binak PU) shall be constructed.

GENERAL DEFINITION

The following terms shall be used in this document.

| | |
|------------------------------|--|
| CLIENT: | National Iranian South Oilfields Company (NISOC) |
| PROJECT: | Binak Oilfield Development – Surface Facilities; Gas & Gas-Condensate Pipelines |
| EPD/EPC CONTRACTOR (GC): | Petro Iran Development Company (PEDCO) |
| EPC CONTRACTOR: | Joint Venture of : Hirgan Energy – Design & Inspection (D&I) Companies |
| VENDOR: | The firm or person who will fabricate the equipment or material. |
| EXECUTOR: | Executor is the party which carries out all or part of construction and/or commissioning for the project. |
| THIRD PARTY INSPECTOR (TPI): | The firm appointed by EPD/EPC CONTRACTOR (GC) and approved by CLIENT (in writing) for the inspection of goods. |
| SHALL: | Is used where a provision is mandatory. |
| SHOULD: | Is used where a provision is advisory only. |
| WILL: | Is normally used in connection with the action by CLIENT rather than by an EPC/EPD CONTRACTOR, supplier or VENDOR. |
| MAY: | Is used where a provision is completely discretionary. |

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2.0 SCOPE

The purpose of this specification is to supplement the requirements for the material compnenets as specified in the requisition for BINAK Gas & Gas-Condensate Pipelines

3.0 NORMATIVE REFERENCES

3.1 LOCAL CODES AND STANDARDS


- IPS-E-TP-350(1) Engineering Standard for Linings
- IPS-M-PI-110(1) Material and Equipment Standard for Valves
- IPS-M-PI-150(2) Material Standard for Flanges and Fittings
- IPS-M-PI-190(3) Material and Equipment Standard for Line Pipe
- IPS-E-PI-140(1) Engineering Standard for Onshore Transportation Pipelines
- IPS-E-PI-221(1) Engineering Standard for Piping Material Selection
- IPS-E-PI-240(2) Engineering Standard for Plant Piping System

3.2 INTERNATIONAL CODES AND STANDARDS

- ASME B1.20.1 Pipe Threads General Purpose (Inch)
- ASME B16.5 Steel Pipe Flanges And Flanged Fittings
- ASME B16.9 Factory-Made Wrought Steel Buttwelding Fittings
- ASME B16.10 Face To Face And End To End Dimension Of Valve
- ASME B16.11 Forged Steel Fittings, Socket Welding And Threaded
- ASME B16.21 Nonmetallic Flat Gaskets For Pipe Flanges
- ASME B16.25 Butt-Welding Ends
- ASME B16.34 Steel Valves, Flanged And Buttwelding Ends
- ASME B16.48 Steel Line Blanks
- ASME B18.2.1 Square And Hex. Bolts And Screws, Inch Series
- ASME B18.2.2 Square And Hex. Nuts
- ASME B31.3 Process Piping
- ASME B31.4 Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids
- ASME B36.10M Welded and Seamless Wrought Steel Pipe.
- ASME B36.19M Stainless Steel Pipe
- ASME B31.8 Gas Transmission and Distribution Piping Systems
- ASME B16.36 Orifice Flanges
- ASME B16.20 Metallic Gaskets for Pipe Flanges
- ASTM A860 Standard Specification for Wrought High-Strength Low-Alloy Steel Butt Welding Fittings
- ASTM A694 Standard Specification for Carbon and Alloy Steel

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- ASTM A516 Forgings for Pipe Flanges, Fittings, Valves, and Parts for High-Pressure Transmission Service
- ASTM A216 Standard Specification for Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service
- ASTM A193 Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High-Temperature Service
- ASTM A194 Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
- ASTM A194 Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High Pressure or High Temperature Service, or Both
- BS EN 10204 Metallic Products – Types of Inspection Documents
- API 5L Specification For Line Pipe
- API 6D Pipeline Valves
- API 599 Steel Plug Valves, Flanged Or Buttwelding Ends
- API 600 Steel Gate Valves, Flanged And Buttwelding Ends
- API 601 Metallic Gaskets For Piping, Double-Jacketed, Corrugated And Spiral Wound
- API 602 Compact Steel Gate Valves
- API 6FA Specification for Fire Test For Valves
- API 608 Metal Ball Valves-Flanged, Threaded, and Welding End
- BS-1868 Flanged And Butt-Welding Ends Steel Check Valves For Petroleum And Petrochemical Industries
- BS-1873 Flanged And Butt-Welding Ends Steel Globe Valves For Petroleum And Petrochemical Industries
- BS EN ISO 17292:2015 Metal ball valves for petroleum, petrochemical and allied industries
- BS EN ISO 15761:2002 Steel gate, globe and check valves for sizes DN 100 and smaller, for the petroleum and natural gas industries
- BS 6775 (PART 2) Testing Of Valve Specification For Fire Type Testing Requirement
- MSS SP-83 Class 300 and 6000 pipe unions, socket welding and threaded
- MSS SP-80 Bronze Gate, globe angle and check valves
- MSS SP-95 Swage Nipples And Ball Plugs
- MSS SP-97 Forged Carbon Steel Branch Olet Fittings
- MSS SP-120 Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and Flared Ends

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- ANSI/NACE MR0175/ ISO 15156-1:2009(E) Petroleum And Natural Gas Industries - Materials For Use In H2S Containing Environments In Oil And Gas Production
- NACE TM-0284 Standard Test Method - Evaluation Of Pipeline And Pressure Vessel Steels For Resistance To Hydrogen-Induced Cracking
- NACE TM-0177 Laboratory Testing Of Metals For Resistance To Sulfide Stress Cracking And Stress Corrosion Cracking In H2s Environments

3.3 THE PROJECT DOCUMENTS

- BK-PPL-PEDCO-320-PL-CN-0001 Calculation Note For Pipeline Wall Thickness
- BK-PPL-PEDCO-320-PI-RT-0001 Corrosion Study & Material Selection Report
- BK-GNRAL-PEDCO-000-PL-DC-0001 Pipeline Design Criteria
- BK-GNRAL-PEDCO-000-PI-SP-0008 Specification For Material Requirements in Sour service

3.4 ENVIRONMENTAL DATA

Refer to "Process Basis of Design; Doc. No. BK-GNRAL-PEDCO-000-PR-DB-0001"

3.5 ORDER OF PRECEDENCE

In case of any conflict between requirements specified herein & the requirements of any other referenced document, this subject shall be reflected to CLIENT and the final decision will be made by CLIENT.

4.0 ABBREVIATIONS

| | |
|-------|---------------------------|
| AFC: | Approved for Construction |
| AFD: | Approved for Design |
| # : | CLASS |
| A/G: | ABOVE GROUND |
| ASB : | ASBESTOS |
| BB : | BOLTED BONNET |
| BC : | BOLTED COVER |
| BE : | BEVEL ENDS |



نگهداشت و افزایش تولید میدان نفتی بینک
سطح الارض

احداث خطوط انتقال گاز/مایعات گازی از ایستگاه تقویت فشار گاز
بینک تا ایستگاه تزریق گاز سیاهمکان/واحد بهره برداری بینک



شماره پیمان:

PIPELINE MATERIAL SPECIFICATION

شماره صفحه: ۸ از ۱۴

۰۵۳ - ۰۷۳ - ۹۱۸۴

| پروژه | بسته کاری | صادرکننده | تسهیلات | رشته | نوع مدرک | سریال | نسخه |
|-------|-----------|-----------|---------|------|----------|-------|------|
| BK | PPL | PEDCO | 320 | PL | SP | 0001 | D03 |

| | |
|---------|-------------------------|
| BLE : | BEVELED LARGE END |
| BW : | BUTT WELDING |
| C.A: | CORROSION ALLOWANCE |
| CONC : | CONCENTRIC |
| CS : | CARBON STEEL |
| ECC : | ECCENTRIC |
| FB: | FULL BORE |
| FLGD: | FLANGED |
| FR : | FLAT RING |
| GJ. : | GASKET JOINT |
| GO: | GEAR OPERATED |
| GR. : | GRADE |
| HEX : | HEXAGONAL |
| HO: | HANDWHEEL OPERATED |
| LR : | LONG RADIUS |
| MO: | MOTOR OPERATED |
| NB : | NOMINAL BORE |
| NPS : | NOMINAL PIPE SIZE |
| NPT: | NOMINAL PIPE THREAD |
| OS&Y : | OUTSIDE SCREW & YOKE |
| PBE: | PLAIN BOTH END |
| PSE : | PLAIN SMALL END |
| PTFE: | POLYTETRAFLUOROETHYLENE |
| RB : | REDUCED BORE |
| RED : | REDUCER/REDUCING |
| RF : | RAISED FACE |
| S.S.: | STAINLESS STEEL |
| SB : | SCREWED BONNET |
| SCH : | SCHEDULE |
| SCR'D : | SCREWED |
| SF : | SERRATED FINISH |



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شماره پیمان:

PIPELINE MATERIAL SPECIFICATION

شماره صفحه: ۹ از ۱۴

۰۵۳ - ۰۷۳ - ۹۱۸۴

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|-------|-----------|-----------|---------|------|----------|-------|------|
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| | |
|--------|---------------------|
| SG : | SCREWED GLAND |
| SMLS : | SEAMLESS |
| SPW : | SPIRAL WOUND |
| STD : | STANDARD |
| SW : | SOCKET WELDING |
| TBE : | THREADED BOTH ENDS |
| THK : | THICKNESS |
| THRD: | THREADED |
| TLE : | THEREADED LARGE END |
| TR : | TRIM |
| TSE : | THEREADED SMALL END |
| UB : | UNION BONNET |
| W.T : | WALL THICKNESS |
| WB : | WELDED BONNET |
| WN : | WELDING NECK |
| XS : | EXTRA STRONG |
| XXS : | DOUBLE EXTRA STRONG |

| | | | | | | | | | | | | | | | | | | |
|---|---|--|-----------|-----------|----------|-------|----------|-------|------|----|-----|-------|-----|----|----|------|-----|------------------------------|
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| BK | PPL | PEDCO | 320 | PL | SP | 0001 | D03 | | | | | | | | | | | |

5.0 PIPING COMPONENTS

5.1 PIPE

- 5.1.1 For carbon steel pipes, dimensions shall conform to ASME B36.10M or API 5L where applicable. The nominal thickness for "Stainless Steel Pipe" shall be selected in accordance with ASME B36.19M. Tolerances of pipes shall meet the requirements of IPS-M-PI-190(3).
- 5.1.2 End pipe for sizes 1/2" to 1 1/2" shall be plain end, for size 2" and above shall be beveled end. End of galvanized pipe shall be threaded.
- 5.1.3 For all Materials Carbon Content and $CE=C+(Mn/6)+(Cu+Ni)/15+(Cr+Mo+V)/5$ shall meet the requirements of IPS-M-PI-190(3). In addition, all the main piping and related materials shall be according to the requirements of NACE MR 0175 / ISO 15156 and IPS-M-PI-190(3) for sour services.
- 5.1.4 Pipes with sizes 1/4", 3/8", 1 1/4", 2 1/2", 3 1/2", 4 1/2", 5", 7", 9", 14", 18", 22", shall not be used, except as may be required by equipment connections.

5.2 FITTING

- 5.2.1 Dimensions and tolerances for butt-weld fitting (be normally used for nominal diameter 2" and larger) shall conform to ASME B16.9.
- 5.2.2 Dimensions and tolerances for Socket weld fittings and/or screwed fitting (be normally used for nominal diameter 1 1/2" and smaller) shall conform to ASME B16.11.

5.3 FLANGES

- 5.3.1 Machining shall be in accordance with ASME B16.5. Roughness of RF shall be between 3.2 and 6.3 micrometers (125 to 250 micro inches AARH)
- 5.3.2 Orifice flanges shall conform to ASME B16.36. Quantities shown on Material Requisition must be understood as "pair" of orifice flanges supplied with assembly bolting.

5.4 VALVES

- 5.4.1 All socket welded ball valves of nominal sizes 1/2" to 1 1/2" shall have extended ends (Sch. 160 nipples) with an overall length of 400mm.
- 5.4.2 Valve trim numbers for gate, globe and check valves are as API 600 (2015) Table 8.
- 5.4.3 Gear operators are required for valves in sizes shown below as IPS-E-PI-221

| RATING | GATE | GLOBE | BALL | BUTTERFLY | PLUG |
|--------|----------------|---------------|---------------|---------------|---------------|
| 300# | 14" and larger | 8" and larger | 6" and larger | 6" and larger | 6" and larger |
| 600# | 12" and larger | 6" and larger | 4" and larger | 4" and larger | - |

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|---|---|--|-----------|-----------|----------|-------|----------|-------|------|----|-----|-------|-----|----|----|------|-----|------------------------------|
| <p>شماره پیمان: ۰۵۳ - ۰۷۳ - ۹۱۸۴</p> | <p>PIPELINE MATERIAL SPECIFICATION</p> <table border="1"> <thead> <tr> <th>پروژه</th> <th>بسته کاری</th> <th>صادرکننده</th> <th>تسهیلات</th> <th>رشته</th> <th>نوع مدرک</th> <th>سریال</th> <th>نسخه</th> </tr> </thead> <tbody> <tr> <td>BK</td> <td>PPL</td> <td>PEDCO</td> <td>320</td> <td>PL</td> <td>SP</td> <td>0001</td> <td>D03</td> </tr> </tbody> </table> | پروژه | بسته کاری | صادرکننده | تسهیلات | رشته | نوع مدرک | سریال | نسخه | BK | PPL | PEDCO | 320 | PL | SP | 0001 | D03 | <p>شماره صفحه : ۱۱ از ۱۴</p> |
| پروژه | بسته کاری | صادرکننده | تسهیلات | رشته | نوع مدرک | سریال | نسخه | | | | | | | | | | | |
| BK | PPL | PEDCO | 320 | PL | SP | 0001 | D03 | | | | | | | | | | | |

5.5 GASKETS

- 5.5.1 Spiral wound gaskets shall conform to ASME B16.20 and Non-metallic flat gaskets shall conform to ASME B16.21.

5.6 BOLTS AND NUTS

- 5.6.1 Thread shall be in accordance with ASME B1.1 and Nuts shall conform to ASME B18.2.2.
- 5.6.2 Stud bolts shall be threaded full length and chamfered both ends. Length for standard flange assembly shall be in accordance with ASME B16.5. Stud bolts shall be supplied with 2 Heavy Hex nuts.

5.7 BRANCH CONNECTIONS

- 5.7.1 Branches shall be as specified in the individual line classes.
- 5.7.2 For pipe line to be pigged, tee or branch with 40% or more of the main line diameter shall be equipped with scraper guide bars.

5.8 UG SERVICE COATING

- 5.8.1 For UG services, all Pipes & Fittings Shall be Solvent Free Epoxy / Three Layer Cold Applied Plastic Tape at Field.

6.0 GENERAL TESTING REQUIRMENTS

- 6.1 Pressure testing of the following piping shall be in accordance with ASME B31.3 test procedures. The test pressure shall be held for a sufficient time to allow detection of any leaks and for a minimum time of 1 hour.
- a) Metallic piping including carbon steel, lined carbon steel, stainless steel, corrosion resistant alloys and ductile iron but excluding copper shall normally be tested at 1.5 x the flange pressure class.
- 6.2 Pipelines designed to ASME B31.8 where the operating pressure results in a hoop stress greater than 30% of the specified minimum yield strength shall be hydrostatically tested or tested with air or gas. The type of test and the test pressure is dependent on Location Class as defined in ASME B31.8 Para. 841.3.2. Test duration shall be a minimum of 2 hours.

| | | | | | | | | | |
|--|---|--|-----------|---------|------|----------|--|----------------------|--|
|  | نگهداشت و افزایش تولید میدان نفتی بینک سطح الارض | | | | | |  | | |
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| | BK | PPL | PEDCO | 320 | PL | SP | 0001 | D03 | |

7.0 PIPING AND PIPELINE CLASSES

7.1 PIPING CLASSES NUMBERING

Each piping class is identified from two alphabetical characters which precede a two digit figure. The first alphabetical character indicates pressure rating of flange and the second alphabetical character indicates material as follows:

| 1st alphabetical character | | 2nd alphabetical character | |
|----------------------------|-----------|----------------------------|--------------|
| C | Class 300 | N | Carbon Steel |
| F | Class 600 | | |

The third figure indicates the design code and the fourth figure indicates corrosion allowance for metallic as follows

| 3rd figure | | 4th figure for metal pipe | | |
|------------|--------------------------------------|------------------------------|------|--------------------------------------|
| Fig. | Design standard | Fig. | C.A. | NACE MR 0175 / ISO 15156 Requirement |
| 1 | ASME B 31.4 (For Liquid Pipeline) | 5 | 3 mm | Yes |
| | | | | |
| 2 | ASME B 31.8 (For Gas Pipeline) | 7 | 6 mm | Yes |
| | | | | |

7.2 SUMMARY OF PIPING AND PIPELINE CLASSES

Table 1: Pipeline classes

| CLASS | RATING | MATERIAL | CORROSION ALLOWANCE (mm) | DESIGN | | SERVICE |
|-------|--------|-----------------------------|--------------------------|--------------|---------------|----------------------------------|
| | | | | PRESS (Psig) | TEMP (°C) max | |
| CN15 | 300# | Carbon Steel NACE MR0175 | 3 | 430 | 85 | Gas Condensate (Sour Service) |
| FN27 | 600# | Carbon Steel NACE MR0175 | 6 | 899 | 85 | Gas (Sour Service) |

| | | | | | | | | | | | | | | | | | | |
|---|--|--|-----------|------------|----------|-------|----------|-------|------|----|-----|-------|-----|----|----|------|-----|-----------------------------|
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| BK | PPL | PEDCO | 320 | PL | SP | 0001 | D03 | | | | | | | | | | | |

CLASSES DESCRIPTION

Class CN15

| CODE | SERVICE | Material | C.A. | RATING | Design | |
|-------------------|----------------|---|------|--------|-----------|--------------|
| ASME B31.4 | Gas Condensate | Carbon Steel (NACE MR-0175/ ISO 15156) | 3 mm | 150# | TEMP (C°) | PRESS (psig) |
| | | | | | -5/85 | 430 |
| ITEM | SIZE | DESCRIPTION | | | | |
| Pipe | 4" | API 5L X52, NACE, PSL2, SMLS, THK 4.8 mm, BE, ACC to API 5L, IPS-M-PI-190 & NACE MR-0175/ ISO 15156. | | | | |
| Fittings | 4" | SMLS, BW, ASTM A860 WPHY52, AS PER PIPE THICKNESS, ACC to IPS-M-PI-150, ASME B16.9, MSS-SP-75 & NACE MR-0175/ ISO 15156. | | | | |
| Flanges | 4" | WN, BW, 300#, RF, ASTM A694 F52, SERRATED FINISH, AS PER PIPE THICKNESS ACC to IPS-M-PI-150, ASME B16.5, MSS-SP-44 & NACE MR-0175/ ISO 15156. | | | | |
| Spectacle Blind | 4" | Spectacle Blind, 300#, FF, ASTM A516 GR.70, ASME B16.48, MR0175/ISO 15156. | | | | |
| Gate Valves | 4" | 300#, H.O., BODY: ASTM A216 WCB, TRIM: AISI 316L+STELLITE6, OS&Y, BB, BG, FE, RF, to API 6D, IPS-MPI-110 & NACE MR-0175/ ISO 15156. | | | | |
| Ball Valves | 4" | 300 #, H.O., BODY: ASTM A216 WCB, TRIM: AISI 316L +Stellite6, FE, RF, API 6D, IPS-MPI-110 & NACE MR-0175/ ISO 15156. | | | | |
| Check Valves | 4" | 300 #, BODY:ASTM A216 WCB, TRIM:AISI 316L+STELLITE6, SWING TYPE, FE, RF, BC, ACC to API 6D, BS 1868, IPS-MPI-110 & NACE MR-0175/ ISO 15156. | | | | |
| Gaskets | 4" | SPIRAL WOUND, 600#, SS 316 WINDING & INNER RING, C.S OUTER RING, ASME B16.20, IPS-M-PI-150 & NACE MR0175/ISO 15156 | | | | |
| Stud Bolts & Nuts | - | STUD BOLTS ASTM A193 B7M, HEAVY HEX NUTS ASTM A194 2HM, ASME B1.1& ASME B18.2.2 | | | | |

| | | | | | | | | | | | | | | | | | | |
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| BK | PPL | PEDCO | 320 | PL | SP | 0001 | D03 | | | | | | | | | | | |

Class FN27  D03

| CODE | SERVICE | Material | C.A. | RATING | PRESS/TEMP. | |
|------------------|---------|---|---------|--------|--------------|-----------------|
| ASME B 31.8 | Gas | Carbon Steel (NACE MR0175/ ISO 15156) | 6 mm | #600 | TEMP (C°) | PRESS (Psig) |
| | | | | | -5/85 | 899 |
| ITEM | SIZE | DESCRIPTION | | | | |
| PIPE | 8" | SMLS, BE, API 5L X52, PSL2, THK 9.53 mm, ACC to API 5L, IPS-M-PI-190(3) & NACE MR0175/ ISO 15156 | | | | |
| FITTINGS | 8" | SMLS, BW, ASTM A860 WPHY52, as per pipe Thickness, ACC to IPS-M-PI-150, ASME B16.9, MSS-SP-75 & NACE MR0175/ ISO 15156 | | | | |
| FLANGES | 8" | WN, BW, RF, 600#, ASTM A694 F52, AS PER PIPE THICKNESS, SERRATED FINISH, ACC to IPS-M-PI-150, ASME B16.5, MSS-SP-44 & NACE MR0175/ ISO 15156 | | | | |
| SPECTACLE BLIND | 8" | SPECTACLE BLIND, 600#, RF, ASTM A516 GR.70, ASME B16.48, NACE MR0175/ ISO 15156 | | | | |
| GATE VALVES | 8" | BB, OS&Y, FLEXIBLE WEDGE, RF, 600#, H.O., BODY: ASTM A216 WCB, TRIM: AISI 316L+STELLITE6, to API 6D, IPS-M-PI-110 & NACE MR0175/ ISO 15156 | | | | |
| BALL VALVES | 8" | TRUNNION MOUNTED, RF, 600 #, 3 PIECES, G.O., BODY: ASTM A216 WCB, BALL: AISI 316L +STELLITE6, RPTFE SEAT, API 6D, IPS-M-PI-110 & NACE MR0175/ ISO 15156 | | | | |
| CHECK VALVES | 8" | SWING TYPE, RF, 600 #, BC, BODY:ASTM A216 WCB, TRIM:AISI 316L+STELLITE6, ACC to API 6D, BS 1868, IPS-M-PI-110 & NACE MR0175/ ISO 15156 | | | | |
| GASKET | 8" | SPIRAL WOUND, 600#, SS 316 WINDING & INNER RING, C.S OUTER RING, ASME B16.20, IPS-M-PI-150 & NACE MR0175/ISO 15156 | | | | |
| STUD BOLT & NUTS | - | STUD BOLTS ASTM A193 B7M, HEAVY HEX NUTS ASTM A194 2HM, ASME B1.1& ASME B18.2.2 | | | | |