# PIPING CLASS: HS4A0E-JA

## SECTION 1.0 – GENERAL

| | | | |
|---|---|---|---|
| **PIPE CLASS:** | **HS4A0E-JA** | **DESIGN CODE:** | ASME B31.3 |
| **RATING:** | 10000 | **PWHT:** | NOTE -52 |
| **FLANGE FACE:** | RTJ | **VALVE TRIM:** | SDSS |
| **BASIC MATERIAL:** | SDSS | **SOUR:** | NO |
| **CORROSION ALLOWANCE:** | 0 MM | **SPECIAL REQUIREMENT:** | NOTE-9 |

### TEMPERATURE (DEG.C) AND PRESSURE (BARG) RATING - (NOTE-179)

| **TEMP.** | -29 | 0 | 38 | 50 | 100 | 120 |
|---|---|---|---|---|---|---|
| **PRESS.** | 460 | 460 | 460 | 460 | 460 | 460 |

### SERVICE

REFER TO PIPING CLASS INDEX

### SIZE RANGE, PIPE WALL THICKNESS (MM) TABLE – (NOTE 9, 211)

| **NPS** | 1 | 1 ½ | 2 | 3 |
|---|---|---|---|---|
| **SCHEDULE** | 80S | 80S | 80S | 80 |
| **THICKNESS** | 4.55 | 5.08 | 5.54 | 7.62 |

# PIPING CLASS: HS4A0E-JA

## SECTION 2.0 – NOTES

### GENERAL NOTES

2. ALL BUTT-WELDED COMPONENT THICKNESSES SHALL MATCH THE PIPE THICKNESS.
3. FOR SPECTACLE BLINDS (FIG-8 FLANGES) & BLINDS REFER TO SPECIFICATION AGES-SP-09-002.
8. FOR SDSS MARTERIAL PREN SHALL BE >40.
9. WALL THICKNESS TO BE IN ACCORDANCE WITH ASME B31.3 CHAPTER IX (SECTION K304.1.2 AND FORMULA (34A)) AND ALSO THE PRESSURE -TEMPERATURE LIMITS SHALL BE ADJUSTED TO SUIT PROJECT SPECIFIC REQUIREMENTS.
15. EXTERNAL FASTENERS (BOLTS, STUDS & NUTS) SHALL BE COATED WITH FLUOROCARBON POLYMER SYSTEM AND SHALL COMPLY WITH SALT SPRAY TEST AS PER MATERIAL SELECTION GUIDELINE AGES-GL-07-001.
37. WALL THICKNESS TO BE IN ACCORDANCE WITH ASME B31.3 CHAPTER IX (SECTION K304.1.2 AND FORMULA (34C)). ALSO, THE PRESSURE -TEMPERATURE LIMITS SHALL BE ADJUSTED SUIT PROJECT SPECIFIC REQUIREMENTS.
52. PWHT SHALL BE BASED ON ASME B31.3 AND THE REQUIREMENTS OF SPECIFICATION AGES-SP-09-002 PIPING MATERIAL SPECIFICATION INDEX.
54. COMPLETE ORIFICE ASSEMBLY SHALL BE SUPPLIED WITH PAIR OF ORIFICE FLANGES EACH HAVING ONE NPS 1/2 FLANGED TAP ( RATING SAME AS PIPE CLASS).
58. THE USE OF SOFT SEATED BALL VALVES IS RESTRICTED TO MAX. DESIGN TEMPERATURE OF 150 OC. THE MATERIALS OF CONSTRUCTION FOR SEAT ARE INDICATIVE. VENDOR IS RESPONSIBLE TO SELECT SUITABLE MATERIAL TO ENSURE SERVICE LIFE OF THE VALVE CONSIDERING THE TYPE OF FLUID, SIZE AND SERVICE CONDITIONS.
71. TO BE USED ONLY WHEN INDICATED ON THE P&ID.
73. NIPOFLANGE SHALL BE USED FOR THERMOWELL CONNECTION FOR HEADER NPS 4 AND ABOVE.
80. THE PIPE THICKNESS ARE CALCULATED BASED ON P-T RATING TABLE FOR THIS CLASS, HOWEVER FOR SIZES NPS 26 AND ABOVE THICKNESS SHALL BE CALCULATED BASED ON PROJECT PROCESS DESIGN PARAMETER.
81. PIPING CLASS COVERS ALL TYPES OF VALVES NORMALLY USED IN THE INDUSTRY. HOWEVER, VALVE TYPE SELECTION SHALL BE AS PER PROCESS ISOLATION PHILOSOPHY (AGES-PH-08-001, AGES-SP-09-003) AND P&ID.
84. BOLT TENSIONING REQUIREMENT SHALL BE AS PER PIPING MATERIAL SPECIFICATION AGES-SP-09-002.
85. SMALL BORE PIPE THE MINIMUM SCHEDULE SHALL BE AS PER AGES-SP-09-001 APPENDIX A1.
90. PIPING TO INSTRUMENT IDBB, FLANGED ON BOTH PROCESS SIDE AND INSTRUMENT SIDE.TO BE USED IN SOUR, TOXIC, SULPHURIC ACID AND VIBRATING SERVICE.
173. FOR API 6A (API 10,000 /5000 PSI) LINE CLASSES THE SELECTED NOMINAL SIZE OF API SPEC 6A FLANGES SHALL BE SELECTED SUCH THAT THERE IS MINIMUM DIMENSIONAL DIFFERENCE BETWEEN THE API 6A FLANGE BORE AND THE BORE OF THE MATING PIPING SYSTEM REFER SECTION 12.3 OF THIS SPECFICATION API 6A. IN ADDITION, API 6A FLANGES SHALL BE SUPPLIED WITH INTEGRAL TRANSITION SPOOL OF 75MMTO MATCH THE PIPE OD AND SCHEDULE.
176. BRANCH TO HEADER CONNECTION SHALL BE REDUCED TEES, EQUAL TEES, SWEEPOLETS OR SIMILAR IN ACCORDANCE WITH CHAPTER IX OF ASME B31.3.
179. MATERIAL CLASS-CC AND PRODUCT SPECIFICATION LEVEL PSL-2 SELECTED BASED ON TEMPERATURE RATING TABLE FOR SERVICE AS PER API 6A.
206. 100% NDE OF ALL GIRTH, LONGITUDINAL AND BRANCH CONNECTIONS IN ACCORDANCE WITH ASME 31.3 K341.4.2.
207. FOR OPERATING TEMPERATURE ABOVE 121°C, DESIGN VERIFICATION SHALL BE DONE ACCORDING TO APPENDIX G OF API SPEC 6A. THE DE RATING SHALL BE APPLIED IN ACCORDANCE TO API 6A ANNEXURE G. IF APPLICABLE THE PROJECT SPECIFIC PIPE CLASS DESIGN TEMPERATURE SHALL BE RESTRICTED ACCORDINGLY.
208. MATERIAL TO CONFORM API 6A AND SHALL COMPLY WITH API 6A PSL 3 REQUIREMENTS.
209. VALVE BODY THICKNESS SHALL INCLUDE THE CORROSION ALLOWANCE OVER AND ABOVE THE MINIMUM THICKNESS AS REQUIRED BY API 6A.
210. WITH PRIOR APPROVAL FROM COMPANY, HUB END VALVES AND PIPE COMPONENTS MAY BE USED IN PLACE OF FLANGED ONE FOR SIZE NPS 6 AND ABOVE. ACCEPTANCE TO BE REVIEWED IN PROJECT STAGE.

# PIPING CLASS: HS4A0E-JA

211. MINIMUM SIZE FOR THIS PIPE CLASS IS DN50, UNLESS NEEDED AS CONTINUATION FOR BRANCH-OFF (BRANCH OFF SHALL BE BY REDUCING TEE ONLY).

# PIPING CLASS: HS4A0E-JA

## SECTION 3.0 – BRANCH TABLE

### $90^0$ BRANCH CONNECTIONS

| BRANCH PIPE (NPS) | 1 | 1 ½ | 2 | 3 |
|---|---|---|---|---|
| 3 | | | | E |
| 2 | | | E | T |
| 1 ½ | | E | T | T |
| 1 | E | T | T | SP |

HEADER PIPE (NPS)

### LEGEND (STANDARD SYMBOLOGY)

| | |
|---|---|
| **C** | CALCULATION IN ACCORDANCE WITH ASME B31.3 |
| **E** | EQUAL TEE |
| **T** | REDUCING TEE |
| **TR** | REDUCING TEE + REDUCER |
| **S** | SWEEPOLET |

# PIPING CLASS: HS4A0E-JA

## SECTION 4.0 – PIPING COMPONENTS

| COMPONENT (TYP) | NPS (INCH) | | END | DESCRIPTION | DIM/ MFG STD. | MATERIAL STD | NOTES |
|---|---|---|---|---|---|---|---|
| | FROM | TO | | | | | |
| **PIPE (NOTE 206)** | | | | | | | |
| PIPE | 1 | 3 | BE | SEAMLESS | B36.10 | ASTM A790 UNS S32750 | 1,85,179, |
| NIPPLE | 2 | 2 | BE | AS PIPE, L=100mm | B36.10 | ASTM A790 UNS S32750 | 85,179 |
| **FITTINGS (NOTE 206)** | | | | | | | |
| ELBOW | 1 | 3 | BE | 90 DEGREE, LR, WROUGHT, SEAMLESS | B16.9 | ASTM A815 WP-S UNS S32750 | 2,179 |
| ELBOW | 1 | 3 | BE | 45 DEGREE, LR, WROUGHT, SEAMLESS | B16.9 | ASTM A815 WP-S UNS S32750 | 2,179 |
| REDUCER | 1 ½ | 3 | BE | CONCENTRIC, WROUGHT, SEAMLESS | B16.9 | ASTM A815 WP-S UNS S32750 | 2,179 |
| REDUCER | 1 ½ | 3 | BE | ECCENTRIC, WROUGHT, SEAMLESS | B16.9 | ASTM A815 WP-S UNS S32750 | 2,179 |
| CAP | 1 | 3 | BE | WROUGHT, SEAMLESS | B16.9 | ASTM A815 WP-S UNS S32750 | 2,179 |
| **BRANCH FITTINGS (NOTE 176, 206)** | | | | | | | |
| TEE | 1 | 3 | BE | EQUAL, WROUGHT, SEAMLESS | B16.9 | ASTM A815 WP-S UNS S32750 | 2,179 |
| TEE | 1 ½ | 3 | BE | REDUCING, WROUGHT, SEAMLESS | B16.9 | ASTM A815 WP-S UNS S32750 | 2,179 |
| SWEEPOLET | 1 | 1 | BE | FORGED, SCH AS PIPE | MSS SP-97 | ASTM A182 GR. F53 | 2,179 |
| **FLANGES (NOTE-206, 207, 208)** | | | | | | | |
| WELDNECK | 2 | 3 | RTJ | API 10000 PSI, TYPE 6BX WITH INTREGRAL TRANSITION PIECE TO MATCH THE OD AND BORE OF PIPE, PSL 3 | API 6A | ASTM A182 GR. F53, API 60K, CLASS PX | 2,173,179 |
| BLIND | 3 | 3 | RTJ | API 10000, TYPE 6BX, PSL 3 | API 6A | ASTM A182 GR. F53, API 60K, CLASS PX | 2 |
| ORIFICE | 2 | 3 | RTJ | API 10000, TYPE 6BX, PSL 3 | B16.36 | ASTM A182 GR. F53, API 60K, CLASS PX | 2,54,173, 179 |

# PIPING CLASS: HS4A0E-JA

| COMPONENT (TYP) | NPS (INCH) | | END | DESCRIPTION | DIM/ MFG STD. | MATERIAL STD | NOTES |
|---|---|---|---|---|---|---|---|
| | FROM | TO | | | | | |
| **LINE BLINDS** | | | | | | | |
| LINE BLIND | 1 | 2 | RTJ | API 10000 PSI, TYPE 6BX, SPECTACLE BLIND | API 6A | ASTM A240 UNS S32750 | 3,179 |
| LINE BLIND | 3 | 3 | RTJ | API 10000 PSI, TYPE 6BX, SPADE & SPACER | API 6A | ASTM A240 UNS S32750 | 3,179 |
| **GASKETS** | | | | | | | |
| GASKET | 2 | 3 | - | API 10000 PSI, TYPE 6BX | API 6A | 6MO OCTAGONAL RING JOINT GASKET | 179 |
| **BOLTS** | | | | | | | |
| STUD BOLT & NUTS | ½ | 3 | - | STUD BOLT C/W 2 HEAVY HEX. NUTS | B18.2.1/ B18.2.2 | STUD: ASTM A193 GR. B7 ASTM A194 GR. 2H | 15,84,179 |

# PIPING CLASS: HS4A0E-JA

## SECTION 5.0 – VALVES

| COMPONENT (TYP) | NPS (INCH) | | END | DESCRIPTION | DIM/ MFG STD. | MATERIAL STD | NOTES |
|---|---|---|---|---|---|---|---|
| | FROM | TO | | | | | |
| **VALVES (NOTE -81,207,208,209,210)** | | | | | | | |
| CHECK | 2 | 3 | RTJ | API 10000 PSL, LIFT TYPE, PSL 3 | API 6A | BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM: SDSS+HF | 173,179 |
| CHECK | 3 | 3 | RTJ | API 10000 PSI, SWING CHECK, PSL 3 | API 6A | BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM: SDSS+HF | 173,179 |
| BALL | 2 | 3 | RTJ | API 10000 PSI, REDUCED BORE, TRUNNION MOUNTED, GEAR, PSL 3 | API 6A | BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM: SDSS<br>SEAT: PEEK | 58,173, 179 |
| BALL | 2 | 3 | RTJ | API 10000 PSI, FULL BORE, TRUNNION MOUNTED, GEAR, PSL 3 | API 6A | BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM: SDSS<br>SEAT: PEEK | 58,71, 173,179 |
| GLOBE | 2 | 3 | RTJ | API 10000 PSI, SWIVEL PLUG DISC, OS&Y, BOLTED BONNET, GEAR, PSL 3 | API 6A | BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM: SDSS+HF | 173,179 |
| NEEDLE | 2 | 2 | RTJ | API 10000 PSI, OS&Y, BOLTED BONNET, LEVER, PSL 3 | API 6A | BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM: SDSS+HF | 173,179 |
| IDBB VALVE (FLG x FLG) | 2 | 2 | RTJ | API 10000 PSI, BALL TYPE BLOCK AND ½" NEEDLE TYPE BLEED VALVE, SPLIT BODY, EXTENDED BONNET, TRUNNION MOUNTED, GEAR OPERATED, PSL 3<br>MIN.14MM BORE | API 6A + MANF STD | BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM: SDSS<br>BALL SEAT: PEEK<br>BLEED VALVE:<br>BODY: API 6A 60K, CLASS CC (SDSS)<br>TRIM:SDSS+HF | 90,173, 179 |