

PIPING CLASS: AF2A3F-FA

SECTION 1.0 – GENERAL

PIPE CLASS:	AF2A3F-FA	DESIGN CODE:	ASME B31.3
RATING:	150	PWHT:	NOTE 52
FLANGE FACE:	FF	VALVE TRIM:	AL BRONZE
BASIC MATERIAL:	NPS ½ to 2: UNS 7060X (Cu Ni 90/10) / NPS 3-24: CS - CEMENT LINED (GROUP 1.1) (NOTE 19)	SOUR:	NO
CORROSION ALLOWANCE:	CA=0 MM Cu/Ni CA=3 MM CS	SPECIAL REQUIREMENT:	NOTES: 155, 157, 159, 161, 162, 163, 164

TEMPERATURE (DEG.C) AND PRESSURE (BARG) RATING – (NOTE-22)

TEMP.	-29	0	38	50	100
PRESS.	16.0	16.0	16.0	16.0	15.7

SERVICE

REFER TO PIPING CLASS INDEX

SIZE RANGE, PIPE WALL THICKNESS (MM) TABLE – (NOTE-96)

NPS	½	¾	1	1 ½	2
SCHEDULE	-	-	-	-	-
THICKNESS	2.00	2.00	2.50	2.50	2.50

SIZE RANGE, PIPE WALL THICKNESS (MM) TABLE – (NOTE-80)

NPS	3	4	6	8	10	12	14	16	18	20	24
SCHEDULE	80	80	40	30	30	30	20	20	20	20	20
THICKNESS	7.62	8.56	7.11	7.04	7.80	8.38	7.92	7.92	7.92	9.53	9.53

NPS	30	36	42	48	52
SCHEDULE	-	-	-	-	-
THICKNESS	CALC	CALC	CALC	CALC	CALC

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SECTION 2.0 - NOTES

GENERAL NOTES

1. IN LINE WITH AGES-GL-08-001 (PROCESS DESIGN BASIS) THE MINIMUM PIPING SIZE IS NPS 1. HOWEVER THE LINE SIZE IN THIS CLASS NPS 3/4 & NPS 1/2 ARE INCLUDED FOR INSTRUMENT CONNECTIONS ONLY.
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.
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.
18. BRANCH FOR THIS SIZES TO BE MADE USING 3" CS-CEMENT LINED FLANGE AND CU/NI REDUCING FLANGE AND THEN CU/NI COMPONENTS.
19. PRESSURE -TEMPERATURE RATING & BRANCH FITTINGS FOR THE UNLISTED MATERIALS SHALL BE VERIFIED WITH VENDOR.
22. ALL PIPING COMPONENTS UPTO NPS 24 SHALL BE DESIGNED FOR VACUUM CONDITION AT AMBIENT TEMPERATURE. FOR HIGHER SIZES VACUUM DESIGN SHALL BE APPLICABLE IF INDICATED IN THE LINELIST.
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).
71. TO BE USED ONLY WHEN INDICATED ON THE P&ID.
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.
82. WELDED PIPES AND WELDED FITTINGS SHALL BE 100% RADIOGRAPHED. WALL THICKNESS NEGATIVE TOLERANCES OF WELDED FITTINGS SHALL NOT BE LESS THAN WELDED PIPE.
83. WHEN SMALL END OF REDUCER IS NPS 16 & BELOW THE REDUCER SHALL BE SEAMLESS.
96. THE PIPE THICKNESS FOR THIS PIPE CLASS ARE BASED ON EEMUA 234, 20 BARG RATING, AND SHALL BE VERIFIED WITH MANUFACTURER FOR THE P/T RATING TABLE GIVEN IN THIS PIPE CLASS.
155. PIPES, FITTINGS AND FLANGES 3 "AND LARGER ARE TO BE INTERNALLY CEMENT LINED IN ACCORDANCE WITH APPLICABLE COMPANY SPECIFICATION / PROJECT SPECIFICATION.
156. SLIP-ON FLANGES SHALL BE USED WITH PIPE SPOOLS.
157. PIPING COMPONENTS 3" TO 24" SHALL BE SUPPLIED WITH FACTORY FITTED PUP PIECES 150MM LONG WELDED ON BOTH ENDS WITH SQUARE CUT ENDS AND A FACTORY FITTED SLEEVE WELDED TO PUP PIECE TO ONE END OF THE FITTINGS AS FOLLOWS:
 - ELBOWS: SLEEVE WELDED TO ANY ONE END
 - REDUCER: SLEEVE WELDED TO LARGER NPS
 - TEES: SLEEVE WELDED TO ONE END OF THE RUN PIPE.
158. SLEEVE JOINTS SHALL BE USED FOR PIPE DIAMETERS $\leq 24"$. PIPING $>24"$ SHALL BE JOINED TOGETHER BY BUTT WELD JOINTS AND THE JOINT LOCATION INTERNALLY LINE IN-SITU AFTER WELDING.
159. FLANGES $\leq 24"$ SHALL BE SUPPLIED WITH FACTORY FITTED PUP PIECE AND FACTORY FITTED SLEEVE WELDED TO THE PUP PIECE. RECOMMENDED PUP PIECE LENGTHS ARE AS FOLLOWS:
 - PIPE SIZE $\leq 10"$ = 175MM LONG
 - PIPE SIZE 12" TO 16" = 225MM LONG
 - PIPE SIZE $>16"$ = 250MM LONG.
161. PIPE SHALL BE SUPPLIED WITH FACTORY FITTED SLEEVE WELDED TO ONE END OF THE PIPE.
162. WHEN CONNECTING ABOVE GROUND CEMENT LINED PIPE TO UNDERGROUND LINE PIPE, USE FLANGE INSULATING ASSEMBLIES TO PREVENT GALVANIC CORROSION.
163. WHEN CONNECTING CS CEMENT LINED PIPE TO CU-NI LINE PIPING - VENT, DRAIN AND INSTRUMENT CONNECTION, USE FLANGE INSULATING ASSEMBLIES TO PREVENT GALVANIC CORROSION.
164. SLEEVES CAN BE MADE FROM PIPE MATERIAL API 5L GR. B OR FABRICATED FROM PLATE MATERIAL.

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- 165. GASKET IS NOT REQUIRED WHEN BOLTING RUBBER LINED BUTTERFLY VALVES TO THE FLANGES.
- 166. THE CEMENT LINING, IN THE ADJACENT PIPE MUST BE SHREDDED TO ACCOMMODATE THE MOVEMENT OF THE VALVE DISC.
- 204. FOR PIPE TO PIPE CONNECTION SHALL BE ADEQUATE REINFORCEMENT PAD BASED ON CALCULATIONS OF BRANCH REINFORCEMENT AS PER ASME B 31.3.

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SECTION 3.0 – BRANCH TABLE

90° BRANCH CONNECTIONS (NOTE 18,19)

BRANCH PIPE (NPS)	HEADER PIPE (NPS)																			
	1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24	30	36	42	48
60																				E
56																			E	P
52																			E	P
48																		E	P	P
42																		E	P	P
36																		E	P	P
30																		E	P	P
24																		E	P	P
20																		E	P	P
18																		E	P	P
16																		E	P	P
14																		E	P	P
12																		E	P	P
10																		E	P	P
8																		E	P	P
6																		E	P	P
4																		E	P	P
3																		E	P	P
2																		E	P	P
1 1/2																		E	P	P
1																		E	P	P
3/4																		E	P	P
1/2																		E	P	P
NOTE-18																				
HEADER PIPE (NPS)																				

LEGEND (STANDARD SYBOLOGY)

C	CALCULATION IN ACCORDANCE WITH ASME B31.3
E	EQUAL TEE
T	REDUCING TEE
TR	REDUCING TEE + REDUCER
W	WELDOLET
P	PIPE TO PIPE CONNECTION

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SECTION 4.0 – PIPING COMPONENTS

COMPONENT (TYP)	NPS (INCH)		END	DESCRIPTION	DIM/ MFG STD.	MATERIAL STD.	NOTES
	FROM	TO					
PIPE							
PIPE	½	2	BE	SEAMLESS, 20 BAR	EEMUA 234	UNS 7060X (90/10 Cu/Ni), EEMUA 234 CHAPTER 1	1
PIPE	3	16	PE	SEAMLESS, CEMENT LINED	B36.10	API 5L GR B (SLEEVE END)	155,158, 161
PIPE	18	24	PE	WELDED, CEMENT LINED	B36.10	API 5L GR B (SLEEVE END)	82,155, 158,161
PIPE	30	60	BE	WELDED, CEMENT LINED	B36.10	API 5L GR B (SLEEVE END)	82,155, 158
NIPPLE	1	2	BE	AS PIPE	EEMUA 234	UNS 7060X (90/10 Cu/Ni), EEMUA 234 CHAPTER 1	
SLEEVE							
SLEEVE	3	24	-	THICKNESS TO MATCH PIPE AND ID TO SUIT PIPE OD	MANF. STD	API 5L GR. B WITHOUT LINING	164
FITTINGS							
ELBOW	½	2	BE	90 DEGREE, LR, WROUGHT, SEAMLESS	EEMUA 234	UNS 7060X, EEMUA 234 CHAPTER 7	2
ELBOW	3	16	PE	90 DEGREE, LR, WROUGHT, SEAMLESS, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-S (SLEEVE END)	155,157
ELBOW	18	24	PE	90 DEGREE, LR, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	82,155, 157
ELBOW	30	48	BE	90 DEGREE, LR, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82, 155
ELBOW	52	60	BE	90 DEGREE, LR, WROUGHT, WELDED, CEMENT LINED	MSS SP- 75 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82, 155
ELBOW	½	2	BE	45 DEGREE, LR, WROUGHT, SEAMLESS	EEMUA 234	UNS 7060X, EEMUA 234 (CHAPTER 7)	2
ELBOW	3	16	PE	45 DEGREE, LR, WROUGHT, SEAMLESS, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-S (SLEEVE END)	155,157
ELBOW	18	24	PE	45 DEGREE, LR, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	82,155, 157
ELBOW	30	48	BE	45 DEGREE, LR, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155

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COMPONENT (TYP)	NPS (INCH)		END	DESCRIPTION	DIM/ MFG STD.	MATERIAL STD.	NOTES
	FROM	TO					
FITTINGS – CONT'D							
ELBOW	52	60	BE	45 DEGREE, LR, WROUGHT, WELDED, CEMENT LINED	MSS SP- 75 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155
REDUCER	¾	2	BE	CONCENTRIC, WROUGHT, SEAMLESS	EEMUA 234	UNS 7060X, EEMUA 234 CHAPTER 7	2
REDUCER	3	16	PE	CONCENTRIC, WROUGHT, SEAMLESS, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-S (SLEEVE END)	155,157
REDUCER	18	24	PE	CONCENTRIC, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	82,83,155, 157
REDUCER	30	48	BE	CONCENTRIC, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155
REDUCER	52	60	BE	CONCENTRIC, WROUGHT, WELDED, CEMENT LINED	MSS SP- 75 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155
REDUCER	¾	2	BE	ECCENTRIC, WROUGHT, SEAMLESS	EEMUA 234	UNS 7060X, EEMUA 234 CHAPTER 7	2
REDUCER	3	16	PE	ECCENTRIC, WROUGHT, SEAMLESS, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-S (SLEEVE END)	155,157
REDUCER	18	24	PE	ECCENTRIC, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	82, 155,157
REDUCER	30	48	BE	ECCENTRIC, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,55
REDUCER	52	60	BE	ECCENTRIC, WROUGHT, WELDED, CEMENT LINED	MSS SP- 75 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,83, 155
CAP	½	2	BE	WROUGHT, SEAMLESS	EEMUA 234	UNS 7060X, EEMUA 234 CHAPTER 7	2
CAP	3	60	BE	WROUGHT, SEAMLESS, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-S (SLEEVE END)	2,155
BRANCH FITTINGS							
TEE	¾	2	BE	EQUAL, WROUGHT, SEAMLESS	EEMUA 234	UNS 7060X, EEMUA 234 CHAPTER 7	2

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COMPONENT (TYP)	NPS (INCH)		END	DESCRIPTION	DIM/ MFG STD.	MATERIAL STD.	NOTES
	FROM	TO					
BRANCH FITTINGS – CONT'D							
TEE	3	16	PE	EQUAL, WROUGHT, SEAMLESS, CEMENT LINED	B16.9/ MFG STD.	ASTM A234 GR. WPB-S (SLEEVE END)	155,157
TEE	18	24	PE	EQUAL, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	82,155, 157
TEE	30	48	BE	EQUAL WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155
TEE	52	60	BE	EQUAL WROUGHT, WELDED, CEMENT LINED	MSS SP- 75 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155
TEE	¾	2	BE	REDUCING, WROUGHT, SEAMLESS	EEMUA 234	UNS 7060X, EEMUA 234 CHAPTER 7	2
TEE	3	16	PE	REDUCING, WROUGHT, SEAMLESS, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-S (SLEEVE END)	155,157
TEE	18	24	PE	REDUCING, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	82,155, 157
TEE	30	48	BE	REDUCING, WROUGHT, WELDED, CEMENT LINED	B16.9 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155
TEE	52	60	BE	REDUCING, WROUGHT, WELDED, CEMENT LINED	MSS SP- 75 / MANF. STD	ASTM A234 GR. WPB-W (SLEEVE END)	2,82,155
FLANGES							
WELDNECK	½	2	FF	CL.150	EEMUA 234	SOLID Cu/Ni AS PER EEMUA 234 CHAPTER 5	2
WELDNECK	½	2	RF	CL.150	EEMUA 234	COMPOSITE Cu/Ni AS PER EEMUA 234 CHAPTER 3	2
SLIP ON	3	24	RF	CL.150, WITH HUB, CEMENT LINED	B16.5	ASTM A105N	155,156, 159
SLIP ON	30	60	RF	CL.150, WITH HUB, CEMENT LINED	B16.47-A	ASTM A105N	155,156
BLIND	½	2	RF	CL.150	B16.5	ASTM A105N WITH Cu/Ni OVERLAY	
BLIND	3	24	RF	CL.150	B16.5	ASTM A105N WITH Cu/Ni OVERLAY	

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COMPONENT (TYP)	NPS (INCH)		END	DESCRIPTION	DIM/ MFG STD.	MATERIAL STD.	NOTES
	FROM	TO					
FLANGES – CONT,D							
BLIND	30	60	RF	CL.150	B16.47-A	ASTM A105N WITH Cu/Ni OVERLAY	
LINE BLINDS							
LINE BLIND	½	10	RF	CL.150, SPECTACLE BLIND	B16.48	ASTM A516 GR. 70 WITH CU NI OVERLAY / Cu-Ni ASTM B171 GR. C70600	3
LINE BLIND	12	24	RF	CL.150, SPADE & SPACER	B16.48	ASTM A516 GR. 70 WITH CU NI OVERLAY / Cu-Ni ASTM B171 GR. C70600	3
LINE BLIND	30	60	RF	CL.150, SPADE & SPACER	MFG STD	ASTM A516 GR. 70 WITH CU NI OVERLAY / Cu-Ni ASTM B171 GR. C70600	3
GASKETS							
GASKET	½	2	-	CL.150, NON- METALLIC FLAT FOR RF FLANGES, FULL FACE, DRILL TO SUIT B16.5, THICK = 3.0MM	B16.21/ B16.5	NEOPRENE, SHORE-A, MIN. HARDNESS 75	
GASKET	3	24	-	CL.150, NON- METALLIC FLAT FOR RF FLANGES, FULL FACE, DRILL TO SUIT B16.5, THICK = 3.0MM	B16.21/ B16.5	NEOPRENE, SHORE-A, MIN. HARDNESS 75	
GASKET	30	60	-	CL.150, NON- METALLIC FLAT FOR RF FLANGES, FULL FACE, DRILL TO SUIT B16.47-A, THICK = 6.0MM	B16.21/ B16.47-A	NEOPRENE, SHORE-A, MIN. HARDNESS 75	
GASKET	½	2	-	CL.150, NON- METALLIC FLAT FOR FF FLANGES, FULL FACE, DRILL TO SUIT B16.5, THICK = 3.0MM	B16.21/ B16.5	NEOPRENE, SHORE-A, MIN. HARDNESS 75	
GASKET	3	24	-	CL.150, NON- METALLIC FLAT FOR FF FLANGES, FULL FACE, DRILL TO SUIT B16.5, THICK = 3.0MM	B16.21/ B16.5	NEOPRENE, SHORE-A, MIN. HARDNESS 75	
GASKET	30	60	-	CL.150, NON- METALLIC FLAT FOR FF FLANGES, FULL FACE, DRILL TO SUIT B16.47-A, THICK = 6.0MM	B16.21/ B16.47-A	NEOPRENE, SHORE-A, MIN. HARDNESS 75	

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COMPONENT (TYP)	NPS (INCH)		END	DESCRIPTION	DIM/ MFG STD.	MATERIAL STD.	NOTES
	FROM	TO					
BOLTS							
STUD BOLT & NUTS	½	60	-	STUD BOLT C/W 2 HEAVY HEX. NUTS	B18.2.1/ B18.2.2	STUD: ASTM A193 GR.B7 ASTM A194 GR.2H	15

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SECTION 5.0 - VALVES

COMPONENT (TYP)	NPS (INCH)		END	DESCRIPTION	DIM/ MFG STD.	MATERIAL STD.	NOTES
	FROM	TO					
VALVES (NOTE - 81)							
CHECK	1	1 ½	RF	CL.150, FLGD TO B16.5, SPRING LOADED LIFT CHECK, BOLTED COVER	BS1868 + ASME B16.34	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	
CHECK	2	24	RF	CL.150, DUAL PLATE, LUGGED WAFER TYPE, TO FIT BETWEEN B16.5 FLANGES	API 594	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	
CHECK	2	24	RF	CL.150, SWING CHECK FLGD TO B16.5	API 6D	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	
GATE	1	1 ½	RF	CL.150, FLGD TO B16.5, SOLID WEDGE, STD PORT, OS&Y, BOLTED BONNET, HANDWHEEL	API 602 + ASME B16.34	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	
GATE	2	42	RF	CL.150, FLGD TO B16.5 / 16.47-A, FLEXIBLE WEDGE, STD PORT, OS&Y, BOLTED BONNET, HANDWHEEL / GEAR	API 600 + ASME B16.34	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	
GATE	48	60	RF	CL.150, FLGD TO B16.47-A, FLEXIBLE WEDGE, STD PORT, OS&Y, BOLTED BONNET, GEAR	ASME B16.34 + MFG. STD.	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	
GLOBE	1	1 ½	RF	CL.150, FLGD TO B16.5, SWIVEL PLUG DISC, OS & Y, BOLTED BONNET, HANDWHEEL	API 602 + ASME B16.34	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	
GLOBE	2	12	RF	CL.150, FLGD TO B16.5, SWIVEL PLUG DISC, OS&Y, BOLTED BONNET, HANDWHEEL / GEAR	API 623 + ASME B16.34	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE	

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COMPONENT (TYP)	NPS (INCH)		END	DESCRIPTION	DIM/ MFG STD.	MATERIAL STD.	NOTES
	FROM	TO					
VALVES (NOTE - 81) – CONT'D							
BUTTERFLY	3	48	FF	CL.150, CONCENTRIC, LUG TYPE TO FIT BETWEEN B16.5 / B16.47-A FLANGES, LEVER / GEAR	API 609, CAT.A	BODY: ASTM A216 WCB LINED WITH CHLOROPRENE RUBBER OR EPDM TRIM : AL-BRONZE	165,166
BUTTERFLY	14	24	RF	CL.150,DOUBLE OFFSET,WAFFER LUG TYPE TO FIT BETWEEN B16.5 FLANGES,GEAR	API 609, CAT.B	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE, PTFE	166
BUTTERFLY	30	48	RF	CL.150,DOUBLE OFFSET, DOUBLE FLGD TO ASME B16.47-A, GEAR	API 609, CAT.B	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE, PTFE	166
BUTTERFLY	50	60	RF	CL.150,DOUBLE OFFSET, DOUBLE FLGD TO ASME B16.47-A, GEAR	BS EN 593 + MFG. STD.	BODY: ASTM B148-UNS C95800 TRIM: AL-BRONZE, PTFE	166