



HYDROCARBON PROCESS PIPING
150 PSIG ± MINUS 150 TO +100F

ITEM	SIZE	DESCRIPTION
N-228		1 SCREWED FITTINGS SHALL NOT BE USED IN PIPING SYSTEMS WHERE VIBRATION IS PRESENT, I.E., COMPRESSOR PIPING, ETC.
N-213		2 PIPING SHALL BE INSTALLED IN ACCORDANCE WITH ENGR SPEC 47-110.
N-18		3 ALL NIPPLES SHALL BE SCH 30 OR HEAVIER.
N-232		4 FOR INSTALLATION OF THREADED STAINLESS STEEL PIPING SYSTEMS, APPLY TEFLON TAPE TO THE MALE PIPE THREADS AND A COAT OF APPROVED JOINT COMPOUND THAT IS COMPATIBLE WITH THE PIPING SYSTEM TO THE FEMALE PIPE THREADS.
NOTE		5 G-44 GASKET TO BE USED ONLY WHERE SPECIFIED ON PIPING DRAWINGS.

PIPE

P-44P	1/2 THRU 1 1/2	ASTM A-312 GR TP304, SCH 30S SEAMLESS STAINLESS STEEL PIPE.
P-35WP	2 THRU 4	ASTM A-312 GR TP304, SCH 40S WELDED STAINLESS STEEL PIPE. WELDS TO BE FLUSH OUTSIDE AND SMOOTH INSIDE. PIPE TO BE FULLY SOLUTION ANNEALED, PICKLED AND PASSIVATED.
P-34WP	6 THRU 24	ASTM A-312 GR TP304, SCH 10S WELDED STAINLESS STEEL PIPE. WELDS TO BE FLUSH OUTSIDE AND SMOOTH INSIDE. PIPE TO BE FULLY SOLUTION ANNEALED, PICKLED AND PASSIVATED.

FITTINGS

ELTX-77P	1/2 THRU 1 1/2	2000-LB THREADED FORGED STAINLESS STEEL FITTINGS, ASTM A-182 GR F304, ANSI B16.11.
U-12P	1/2 THRU 1 1/2	3000-LB THREADED STAINLESS STEEL UNION, ASTM A-182 GR F304, VOGT 1931-F8 OR PETRO 304.

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ITEM	SIZE	DESCRIPTION
C-13PC	1/2 THRU 1 1/2	3000-LB THREADED STAINLESS STEEL COUPLING, ASTM A-182 GR F304, ANSI B16.11.
C-15PS	1/2 THRU 1 1/2	3000-LB STAINLESS STEEL SOCKOLET, ASTM A-182 GR F304.
C-56	1/2 THRU 1 1/2	3000-LB THREADED STAINLESS STEEL NIPPLET, ASTM A-182 GR F304L, DIMENSIONS PER BONNEY FORGE CATALOG W-8, PG.29.
C-50P	1 THRU 20	SCH 40S STAINLESS STEEL WELDOLET, ASTM A-182 GR F304.
PC-6P	1/2 THRU 1 1/2	THREADED SOLID STAINLESS STEEL HEX HEAD PLUG, ASTM A-182 GR F304, ANSI B16.11.
R-83P	1/2 THRU 1 1/2	EX STRONG STAINLESS STEEL SWAGED NIPPLE, TYPE 304, 0.08 PER CENT MAX CARBON, THREADED, BEVELED, PLAIN OR ANY COMBINATION OF ENDS.
ELT-65P	1/2 THRU 1 1/2	3000-LB SOCKET WELDING FORGED STAINLESS STEEL FITTINGS, ASTM A-182 GR F304, ANSI B16.11.
C-15PC	1/2 THRU 1 1/2	3000-LB SOCKET WELDING STAINLESS STEEL COUPLING, ASTM A-182 GR F304, ANSI B16.11.
C-56S	1/2 THRU 1 1/2	3000-LB SOCKET WELDING STAINLESS STEEL NIPPLET, ASTM A-182 GR F304L, DIMENSIONS PER BONNEY FORGE CATALOG W-8, PG.29.
PC-35P	1/2 THRU 1 1/2	3000-LB THREADED FORGED STAINLESS STEEL CAP, ASTM A-182 GR F304, ANSI B16.11.
U-18	1/2 THRU 1 1/2	FOR UNION USE SOCKET WELDING FLANGES.
U-29P	1/2 THRU 1 1/2	3000-LB SOCKET WELDING STAINLESS STEEL UNION, ASTM A-182 GR F304, VOGT SW-1931-F3 OR PETRO 304.
ELTR-63P	2 THRU 4	SCH 40S STAINLESS STEEL WELDING FITTINGS, ASTM A-403 GR WP304, ANSI B16.9.
ELTR-62P	6 THRU 24	SCH 10S STAINLESS STEEL WELDING FITTINGS, ASTM A-403 GR WP304, ANSI B16.9 PRESSURE TEMPERATURE RATING.
N-49		WELDING FITTINGS TO BE BY B AND W, CRANE.

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ITEM	SIZE	DESCRIPTION
		DYNAMIC PRODUCTS, FLOWLINE, LADISH, TAYLOR FORGE OR TUBE-TURN.
PC-65P	2 THRU 4	SCH 40S STAINLESS STEEL WELDING CAP, ASTM A-403 GR WP304, ANSI B16.9.
PC-64P	6 THRU 24	SCH 10S STAINLESS STEEL WELDING CAP, ASTM A-403 GR WP304, ANSI B16.9 PRESSURE TEMPERATURE RATING.
PC-43P	14 THRU 24	ASME FLANGED AND DISHED OR ELLIPSOIDAL STAINLESS STEEL HEAD WITH 1 1/2 INCH STRAIGHT FLANGE, 0.250 WALL, O.D. TO CONFORM WITH PIPE SIZE, ASTM A-240 TYPE 304. SOLUTION HEAT TREATED AT 1900F MINIMUM AND WATER OR OIL QUENCHED.

FLANGES

F-86P-RF	1/2 THRU 1 1/2	150-LB RAISED FACE THREADED FLANGE, ASTM A-182 GR F304 STAINLESS STEEL, ANSI B16.5.
F-72P-RF	1/2 THRU 1 1/2	300-LB RAISED FACE SOCKET WELDING FLANGE, ASTM A-182 GR F304 STAINLESS STEEL, ANSI B16.5.
F-61P-RF	2 THRU 24	150-LB RAISED FACE WELDING NECK FLANGE, ASTM A-182 GR F304 STAINLESS STEEL, ANSI B16.5, BORE TO MATCH PIPE.
F-62P-RF	2 THRU 24	300-LB RAISED FACE SLIP-ON FLANGE, ASTM A-182 GR F304 STAINLESS STEEL, ANSI B16.5.
F-60P-RF	1/2 THRU 24	150-LB RAISED FACE BLIND FLANGE, ASTM A-182 GR F304 STAINLESS STEEL, ANSI B16.5.

BRANCH CONNECTIONS

BC-7S	FOR SOCKET WELDING AND THREADED PIPING, USE STRAIGHT SIZE TEE ONLY. USE SOCKET WELDING REDUCER INSERT OR SWAGE NIPPLE WHEN BRANCH IS SMALLER THAN HEADER.
BC-112	FOR WELDED PIPING, USE STRAIGHT SIZE OR REDUCING TEE. WELDOLET OR REINFORCING PAD MAY BE USED ON REDUCING BRANCH CONNECTIONS IN PLACE OF REDUCING TEE. FOR 3/4 INCH AND SMALLER, USE SOCKOLET WELDED TO HEADER.

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ITEM	SIZE	DESCRIPTION
<u>GASKETS</u>		
G-40C		SPIRAL-WOUND, 304 STAINLESS STEEL-ASBESTOS GASKET WITH STAINLESS STEEL GAGE RING, FLEXITALLIC CG, GARLOCK CR, LAMONS WR, JM-913 OR STERLING GR.
G-44		SPIRAL-WOUND 304 STAINLESS STEEL-ASBESTOS GASKET WITH STAINLESS STEEL INNER AND OUTER COMPRESSION-GAUGE RINGS, ID SAME AS SCH 5S PIPE, FLEXITALLIC CGI, GARLOCK CRI, LAMONS WRI, JM-913-IR OR STERLING GR-IR.
<u>JOINT COMPOUND</u>		
JC-15		TEFLON TAPE 1/2 INCH BY 3 MIL THICKNESS.
JC-19		LIQUID-O-RING LUBCON 404 OR SLICK SEAL NO 4 THREAD SEAL.
<u>FLANGE BOLTS</u>		
B-A193B8		ASTM A-193 OR A-320 GR B8 AUSTENITIC STEEL STUD BOLTS WITH ASTM A-194 GR 8 HEAVY HEX NUTS.
B-B164M		ASTM B-154 MONEL 400 COLD DRAWN STUD BOLTS WITH ROUGH TURNED FORGING QUALITY HEAVY HEX NUTS.
NOTE		WHERE BOLTS WILL BE EXPOSED TO CHLORIDE STRESS CORROSION CRACKING USE B-B164M BOLTING.
N-231		APPLY BOLT LUBRICANT TO THE FULL LENGTH OF THREADS.
<u>BOLT LUBRICANT</u>		
BL-1A		ARMITE LEO-PLATE 250.
<u>VALVES</u>		
V-579C	1/2 THRU 1 1/2	600-LB SCREWED OS/Y SOLID WEDGE GATE VALVE, 316 STAINLESS STEEL FOR CRYOGENIC SERVICE TO MINUS 200F, BOLTED BONNET.
V-579SWC	1/2 THRU 1 1/2	600-LB SOCKET WELDING OS/Y SOLID WEDGE GATE VALVE, 316 STAINLESS STEEL FOR CRYOGENIC SERVICE TO MINUS 200F, BOLTED BONNET.

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ITEM	SIZE	DESCRIPTION
V-579SCS	1/2 THRU 1 1/2	600-LB FEMALE SOCKET WELD BY SCREWED OS/Y SOLID WEDGE GATE VALVE, 316 STAINLESS STEEL FOR CRYOGENIC SERVICE TO MINUS 200F, BOLTED BONNET.
V-305AC	1 THRU 12	150-LB FLANGED, ANSI B16.5 FLANGE THICKNESS, OS/Y DOUBLE WEDGE GATE VALVE, 316 STAINLESS STEEL FOR CRYOGENIC SERVICE TO MINUS 200F, BOLTED BONNET, TEFLON PACKING.
V-152	2 THRU 12	150-LB FLANGED OS/Y WEDGE GATE VALVE, ASTM A-352, GR LC-3 BODY, TYPE 316 STAINLESS STEEL TRIM FOR SERVICE TO MINUS 150F.
V-628AC	14 THRU 24	150-LB FLANGED OS/Y GATE VALVE, ALL 316 STAINLESS STEEL FOR CRYOGENIC SERVICE TO MINUS 200F.
V-505C	1/2 THRU 1 1/2	150-LB SCREWED OS/Y GLOBE VALVE, 316 STAINLESS STEEL FOR CRYOGENIC SERVICE TO MINUS 200F, PLUG TYPE DISC, BOLTED BONNET.
V-355AC	1/2 THRU 6	150-LB FLANGED OS/Y GLOBE VALVE, 316 STAINLESS STEEL, TEFLON PACKING, BOLTED BONNET FOR CRYOGENIC SERVICE TO MINUS 200F.
V-282AC	1/2 THRU 6	150-LB FLANGED, ANSI B16.5 FLANGE THICKNESS, HORIZONTAL SWING CHECK VALVE, TYPE 316 STAINLESS STEEL FOR CRYOGENIC SERVICE TO MINUS 200F.
V-159	2 THRU 12	150-LB FLANGED HORIZONTAL SWING CHECK VALVE, ASTM A-352 GR LC-3 BODY AND CAP, 316 STAINLESS STEEL TRIM, FOR MINUS 150F SERVICE.
V-678AC	1/2 THRU 6	150-LB FLANGED, ANSI B16.5 FLANGE THICKNESS, ANGLE VALVE, 316 STAINLESS STEEL, FOR CRYOGENIC SERVICE TO MINUS 200F, BOLTED BONNET, TEFLON PACKING.

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ITEM	SIZE	DESCRIPTION
V-144	1 1/2 THRU 2	150-LB FLANGED, 3-WAY, 2-PORT, 90 DEG TURN, TRANSFLO TYPE PLUG VALVE WITH TAPERED PLUG, ASTM A-352 GR LC-3 BODY, WRENCH OPERATED, LUBRICATED, FOR MINUS 150F SERVICE.
V-145	3 THRU 4	150-LB FLANGED, 3-WAY, 2-PORT, 90 DEG TURN, TRANSFLO TYPE PLUG VALVE WITH TAPERED PLUG, ASTM A-352 GR LC-3 BODY, WRENCH OPERATED, LUBRICATED, FOR MINUS 150F SERVICE.
V-145A	1 1/2 THRU 4	150-LB FLANGED, 3-WAY, 2-PORT, 90 DEG TURN, TRANSFLO TYPE PLUG VALVE WITH TAPERED PLUG, 316 STAINLESS STEEL BODY, ELECTROLIZED NICKEL PLUG WRENCH OPERATED, LUBRICATED, FOR MINUS 200F SERVICE.
V-146	6 THRU 12	150-LB FLANGED, 3-WAY, 2-PORT, 90 DEG TURN, TRANSFLO TYPE PLUG VALVE WITH TAPERED PLUG, ASTM A-352 GR LC-3 BODY, WORM GEAR OPERATED, LUBRICATED, FOR MINUS 150F SERVICE.
V-402	2 THRU 10	150-LB WELD END 3-BOLT LINE BLIND VALVE, 316 STAINLESS STEEL FLUID CONTACTING PARTS, 300 SST SERIES BOLTING, SAFETY LOCKING PIN, TEFLON-PACKED PLATE FOR MINUS 200F SERVICE, BORE TO MATCH PIPE.

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