

TECHNICAL SPECIFICATION

Subject: Procurement of Flanges & Pipe Fittings for RTA 2023 as well General consumption

Tender Ref. No.: OC01000374/BHA

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
00010	M-BEND-00001	BEND/180D/80NB/SCH XXS/S.R/GR WPB/IBR/SA BEND/180D/80NB/SCH XXS/S.R/GR WPB/IBR/SA 234 GR WPB	10	Numbers
00020	M-CAPS-00001	CAP 0.50 B16.11/SCRD3000/ASTMA105 . CAP 0.50 B16.11/SCRD3000/ASTMA105.	30	Numbers
00030	M-CAPS-00013	CAP,A105, SCRF, 3000, 0.5 INCH CAP, B-16.11, ASTM A 105, SCRF, 3000, 0.5 INCH	50	Numbers
00040	M-CAPS-00014	CAP,A105, SCRF, 3000, 0.75 INCH CAP, B-16.11, ASTM A 105, SCRF, 3000, 0.75 INCH	50	Numbers
00050	M-CAPS-00170	CAP 1.00 B16.11/SCRF/3000/ASTMA105/IBR CAP 1.00 B16.11/SCRF/3000/ASTMA105/IBR	20	Numbers
00060	M-CAPS-00171	CAP 1" B16.11/SCRF/3000/ASTM A182 GR.F11 CAP 1.00 B16.11/SCRF/3000/ASTM A182 GR.F11/IBR	20	Numbers
00070	M-CPLG-00001	F.CPLG. 0.50 B16.11/SW/3000/ASTMA105 . F.CPLG. 0.50 B16.11/SW/3000/ASTMA105.	250	Numbers
00080	M-CPLG-00005	F.CPLG. 1.00 B16.11/SW/3000/ASTMA105 . F.CPLG. 1.00 B16.11/SW/3000/ASTMA105.	260	Numbers
00090	M-CPLG-00006	F.CPLG. 1.00 B16.11/SW/6000/ASTMA105 . F.CPLG. 1.00 B16.11/SW/6000/ASTMA105.	30	Numbers
00100	M-CPLG-00039	CPLNG.HALF,A105, SW, 6000, 0.75 INCH CPLNG.HALF, B-16.11, ASTM A 105, SW, 6000, 0.75 INCH	2	Numbers
00110	M-CPLG-00043	CPLNG.HALF,A105, SW, 6000, AXN2, 0.75 I CPLNG.HALF, B-16.11, ASTM A 105, SW, 6000, AXN2, 0.75 INCH	60	Numbers
00120	M-CPLG-00053	CPLNG.HALF,A105, BW, 3000, 0.5 INCH CPLNG.HALF, B-16.11, ASTM A 105, BW, 3000, 0.5 INCH	10	Numbers
00130	M-CPLG-00061	CPLNG.FULL,A105, SW, 6000, AXN2, 0.5INC CPLNG.FULL, B-16.11, ASTM A 105, SW, 6000, AXN2, 0.5INCH	72	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
00140	M-CPLG-00069	CPLNG.FULL,F304, SW, 3000, 0.5 INCH CPLNG.FULL, B-16.11, ASTM A 182 GR.F304, SW, 3000, 0.5 INCH	20	Numbers
00150	M-CPLG-00072	CPLNG.FULL,A105, SW, 3000, AXN2, 1.5INC CPLNG.FULL, B-16.11, ASTM A 105, SW, 3000, AXN2, 1.5INCH	20	Numbers
00160	M-CPLG-00074	CPLNG.FULL,A105, SW, 6000, 0.5 INCH CPLNG.FULL, B-16.11, ASTM A 105, SW, 6000, 0.5 INCH	60	Numbers
00170	M-CPLG-00075	CPLNG.FULL,A105, SW, 6000, 0.75 INCH CPLNG.FULL, B-16.11, ASTM A 105, SW, 6000, 0.75 INCH	220	Numbers
00180	M-CPLG-00104	H.CPLG. 0.75 B16.11/SW/3000/ASTMA105 . H.CPLG. 0.75 B16.11/SW/3000/ASTMA105.	470	Numbers
00190	M-CPLG-00106	H.CPLG. 1.00 B16.11/SW/3000/ASTMA105 . H.CPLG. 1.00 B16.11/SW/3000/ASTMA105.	200	Numbers
00200	M-CPLG-00108	H.CPLG. 1.50 B16.11/SW/3000/ASTMA105 . H.CPLG. 1.50 B16.11/SW/3000/ASTMA105.	170	Numbers
00210	M-CPLG-00112	H.CPLG 0.50 B16.11 SW 3000 ASTMA 105 H2 HALF COUPLING 0.50 B-16.11 SW 3000 ASTMA 105 H2	15	Numbers
00220	M-CPLG-00113	F.CPLG 0.750 B16.11 SW 3000 ASTMA 105 H2 FULL COUPLING 0.750 B-16.11 SW 3000 ASTMA 105 H2	15	Numbers
00230	M-CPLG-00159	H.CPLG. 0.75 B16.11/SW/3000/ASTMA182GrF3 H.CPLG. 0.75 B16.11/SW/3000/ASTMA182GrF304	20	Numbers
00240	M-CPLG-00162	Half Coupling NACE/1/2"/6000#/ASTM A 1 Half Coupling NACE/1/2"/6000#/ASTM A 105/SW/B - 16.11	25	Numbers
00250	M-CPLG-00163	Half Coupling LTCS/1/2"/6000#/F5/ASTM Half Coupling LTCS/1/2"/6000#/F5/ASTM A 182 GR.F5/SW/B - 16.11	15	Numbers
00260	M-CPLG-00164	Half Coupling LTCS/3/4"/6000#/F5/ASTM Half Coupling LTCS/3/4"/6000#/F5/ASTM A 182 GR.F5/SW/B - 16.11	15	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
00270	M-CPLG-00165	Half Coupling (NACE + H2)/1/2"/6000#/A Half Coupling (NACE + H2)/1/2"/6000#/ASTM A 105/SW/B - 16.11	20	Numbers
00280	M-CPLG-00166	Half Coupling NACE/1/2"/9000#/ASTM A 1 Half Coupling NACE/1/2"/9000#/ASTM A 105/SW/B - 16.11	15	Numbers
00290	M-CPLG-00167	Half Coupling NACE/3/4"/9000#/ASTM A 1 Half Coupling NACE/3/4"/9000#/ASTM A 105/SW/B - 16.11	15	Numbers
00300	M-CPLG-00168	Half Coupling/1/2"/3000#/A182 GR. F304 Half Coupling/1/2"/3000#/A182 GR. F304L/SW/B - 16.11	15	Numbers
00310	M-CPLG-00169	Half Coupling LTCS/1/2"/6000#/F11/ASTM Half Coupling LTCS/1/2"/6000#/F11/ASTM A 182 GR.F11/SW/B - 16.11	15	Numbers
00320	M-CPLG-00170	Half Coupling LTCS/3/4"/6000#/F11/ASTM Half Coupling LTCS/3/4"/6000#/F11/ASTM A 182 GR.F11/SW/B - 16.11	15	Numbers
00330	M-CPLG-00171	Full Coupling NACE/3/4"/6000#/ASTM A 1 Full Coupling NACE/3/4"/6000#/ASTM A 105/SW/B - 16.11	60	Numbers
00340	M-CPLG-00172	Full Coupling NACE/1.5"/6000#/ASTM A 1 Full Coupling NACE/1.5"/6000#/ASTM A 105/SW/B - 16.11	20	Numbers
00350	M-CPLG-00173	Full Coupling LTCS/1/2"/6000#/F5/ASTM Full Coupling LTCS/1/2"/6000#/F5/ASTM A 182 GR.F5/SW/B - 16.11	30	Numbers
00360	M-CPLG-00174	Full Coupling LTCS/3/4"/6000#/F5/ASTM Full Coupling LTCS/3/4"/6000#/F5/ASTM A 182 GR.F5/SW/B - 16.11	20	Numbers
00370	M-CPLG-00176	Full Coupling LTCS/1.5"/6000#/F5/ASTM Full Coupling LTCS/1.5"/6000#/F5/ASTM A 182 GR.F5/SW/B - 16.11	15	Numbers
00380	M-CPLG-00177	Full Coupling (NACE + H2)/3/4"/6000/A1 Full Coupling (NACE + H2)/3/4"/6000/A105/ASTM A 105/SW/B - 16.11	15	Numbers
00390	M-CPLG-00178	Full Coupling (NACE + H2)/1.5"/6000/A1 Full Coupling (NACE + H2)/1.5"/6000/A105/ASTM A 105/SW/B - 16.11	15	Numbers
00400	M-CPLG-00179	Full Coupling NACE/1/2"/9000#/ASTM A 1 Full Coupling NACE/1/2"/9000#/ASTM A 105/SW/B - 16.11	15	Numbers
00410	M-CPLG-00180	Full Coupling NACE/3/4"/9000#/ASTM A 1 Full Coupling NACE/3/4"/9000#/ASTM A 105/SW/B - 16.11	15	Numbers
00420	M-CPLG-00181	Full Coupling NACE/1.5"/9000#/ASTM A 1 Full Coupling NACE/1.5"/9000#/ASTM A 105/SW/B - 16.11	15	Numbers
00430	M-CPLG-00182	Full Coupling/1/2"/3000#/A182 GR. F304	15	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		Full Coupling/1/2"/3000#/A182 GR. F304L/SW/B - 16.11		
00440	M-CPLG-00183	Full Coupling/3/4"/3000#/A182 GR. F304 Full Coupling/3/4"/3000#/A182 GR. F304L/SW/B - 16.11	15	Numbers
00450	M-CPLG-00184	Full Coupling/1.5"/3000#/A182 GR. F304 Full Coupling/1.5"/3000#/A182 GR. F304L/SW/B - 16.11	15	Numbers
00460	M-CPLG-00185	Full Coupling LTCS/1/2"/6000#/ASTM A 1 Full Coupling LTCS/1/2"/6000#/ASTM A 182 GR.F11/SW/B - 16.11	15	Numbers
00470	M-CPLG-00186	Full Coupling LTCS/3/4"/6000#/ASTM A 1 Full Coupling LTCS/3/4"/6000#/ASTM A 182 GR.F11/SW/B - 16.11	15	Numbers
00480	M-CPLG-00187	Full Coupling LTCS/1.5"/6000#/ASTM A 1 Full Coupling LTCS/1.5"/6000#/ASTM A 182 GR.F11/SW/B - 16.11	15	Numbers
00490	M-CPLG-00188	F.CPLG/1.5/B16.11/SW/3000/ASTMA105/IBR F.CPLG/1.5/B16.11/SW/3000/ASTMA105/IBR	15	Numbers
00500	M-CPLG-00189	HLF CPLG/2.0/BW/HVY/ASTM A234 GR.WPB HLF CPLG/2.0/BW/HVY/ASTM A234 GR.WPB	15	Numbers
00510	M-CPLG-00341	H.CPLG.,0.50",B16.11,SW,3000,ASTMA105 H.CPLG.,0.50",B16.11,SW,3000,ASTM A 105.	350	Numbers
00520	M-CPLG-00342	F.CPLG.1.00 B16.11/SW/3000/ASTMA105/IBR F.CPLG. 1.00 B16.11/SW/3000/ASTM A105/IBR	150	Numbers
00530	M-CPLG-00343	H.CPLG.1.00 B16.11/SW/3000/ASTMA105/IBR H.CPLG. 1.00 B16.11/SW/3000/ASTM A105/IBR	30	Numbers
00540	M-CPLG-00344	H.CPLG.0.75 B16.11/SW/3000/ASTMA105/IBR H.CPLG. 0.75 B16.11/SW/3000/ASTM A105/IBR	30	Numbers
00550	M-CPLG-00359-00	F Coupling1.5/SW/3000#/ASTM A182 Gr.F304 Full Coupling 1.5/SW/3000#/B16.11/ASTM A182 Gr.F304	15	Numbers
00560	M-CPLG-00373	CPLNG.FULL A 105 SW 3000 0.75 IN CPLNG.FULL B-16.11 ASTM A 105 SW 3000 0.75 INCH WJ602D2Z005ZZZZZZ	300	Numbers
00570	M-CPLG-00375	CPLNG.FULL A 105 SW 3000 1.5 INCH CPLNG.FULL B-16.11 ASTM A 105 SW 3000 1.5 INCH WJ602D2Z008ZZZZZZ	140	Numbers
00580	M-CPLG-00377	CPLNG.FULL A 105 SW 3000 H2 1.5 IN CPLNG.FULL B-16.11 ASTM A 105 SW 3000 H2 1.5 INCH WJ602D2Z708ZZZZZZ	10	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
00590	M-CPLG-00399	CPLNG.FULL ASTM A 105 SW 3000 0.5 IN CPLNG.FULL B-16.11 ASTM A 105 SW 3000 0.5 INCH WJ602D2Z004ZZZZZZ	186	Numbers
00600	M-CPLG-00409	1.5",CPLG.HALF,SW,3000,A105, B16.11,IBR 1.5 " , COUPLING.HALF , A2A , SW, 3000#, ASTM A 105, B-16.11(IBR)	15	Numbers
00610	M-CPLG-00412	CPLNG.HALF A 105 SW 6000 0.5 IN CPLNG.HALF B-16.11 ASTM A 105 SW 6000 0.5 INCH WK602D3Z004ZZZZZZ	50	Numbers
00620	M-CPLG-00413	0.75", CPLG.HALF,SW,6000,A105,B16.11 0.75 " , COUPLING.HALF , A1A , SW, 6000#, ASTM A 105, B-16.11	5	Numbers
00630	M-CPLG-00416	CPLNG.HALF SW 6000 H2 1.5 IN CPLNG.HALF B-16.11 ASTM A 105 SW 6000 H2 1.5 INCH WK602D3Z708ZZZZZZ	15	Numbers
00640	M-CPLG-00423	CPLNG.HALF A 182 GR.F304 SW 3000 1.5 IN CPLNG.HALF B-16.11 ASTM A 182 GR.F304 SW 3000 H2 1.5 INCH WK642D2Z708ZZZZZZ	15	Numbers
00650	M-CPLG-00424	CPLNG.HALF 182 GR.F304L SW 3000 0.75 CPLNG.HALF B-16.11 ASTM A 182 GR.F304L SW 3000 0.75 INCH WK644D2Z005ZZZZZZ	15	Numbers
00660	M-CPLG-00427	CPLNG.HALF A 182 GR.F5 SW 6000 0.75 IN CPLNG.HALF B-16.11 ASTM A 182 GR.F5 SW 6000 0.75 INCH WK652D3Z005ZZZZZZ	10	Numbers
00670	M-CPLG-00434	F.CPLG.0.75 B-16.11/SW/3000/A182Gr.F316L FULL COUPLING 0.75 B-16.11 SW 3000 ASTM A182 Gr. F316L	20	Numbers
00680	M-CPLG-00436	H.CPLG. 0.50 B16.11/SW/3000/ASTMA105/IBR H.CPLG. 0.50 B16.11/SW/3000/ASTMA105/IBR	30	Numbers
00690	M-CPLG-00438	F.CPLG. 0.75 B16.11/SW/3000/ASTMA105/IBR F.CPLG. 0.75 B16.11/SW/3000/ASTMA105/IBR	40	Numbers
00700	M-CPLG-00451	H.CPLG.0.50 B-16.11/SW/3000/A182Gr.F316L H.CPLG.0.50 B-16.11/SW/3000/A182Gr.F316L	15	Numbers
00710	M-CPLG-00452	F.CPLG.0.50 B-16.11/SW/3000/A182Gr.F316L F.CPLG.0.50 B-16.11/SW/3000/ASTM A182Gr.F316L	20	Numbers
00720	M-CPLG-00453	H.CPLG.0.75 B-16.11/SW/3000/A182Gr.F316L H.CPLG.0.75 B-16.11/SW/3000/ASTM A182Gr.F316L	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
00730	M-CPLG-00455	F.CPLG.1.50 B-16.11/SW/3000/A182Gr.F316L F.CPLG.1.50 B-16.11/SW/3000/ASTM A182Gr.F316L	10	Numbers
00740	M-CPLG-00544	FULL COUPLING 1.500 SW 6000 A 105 FULL COUPLING 1.500 B-16.11 SW 6000 ASTMA 105	20	Numbers
00750	M-CPLG-00548	FULL COUPLING 0.500 SW 3000 A 105 H2 FULL COUPLING 0.500 B-16.11 SW 3000 ASTMA 105 H2	35	Numbers
00760	M-CPLG-00553	FULL COUPLING 0.750 SW 6000 A182 GR.F5 FULL COUPLING 0.750 B-16.11 SW 6000 ASTMA182 GR.F5	25	Numbers
00770	M-CPLG-00556	FULL COUPLING 1.000 SW 3000 A182 GRF11 FULL COUPLING 1.000 B-16.11 SW 3000 ASTMA182 GRF11	120	Numbers
00780	M-CPLG-00567	HALF COUPLING 0.750 SW 3000 A 105 H2 HALF COUPLING 0.750 B-16.11 SW 3000 ASTMA 105 H2	40	Numbers
00790	M-CPLG-00571	HALF CPLG 1.000 SW 3000 A182 GR.F11 IBR HALF COUPLING 1.000 B-16.11 SW 3000 ASTMA182 GR.F11 IBR	30	Numbers
00800	M-CPLG-00572	HALF CPLG 1.500 SW 3000 A182 GR.F11 IBR HALF COUPLING 1.500 B-16.11 SW 3000 ASTMA182 GR.F11 IBR	15	Numbers
00810	M-ELBO-00003	90D ELBOW 0.50 B16.11/SW/3000/ASTMA105 . 90D ELBOW 0.50 B16.11/SW/3000/ASTMA105.	300	Numbers
00820	M-ELBO-00004	90D ELBOW 0.75 B16.11/SW/3000/ASTMA105 . 90D ELBOW 0.75 B16.11/SW/3000/ASTMA105.	700	Numbers
00830	M-ELBO-00005	90D ELBOW 1.00 B16.11/SW/3000/ASTMA105 . 90D ELBOW 1.00 B16.11/SW/3000/ASTMA105.(EIL Item Code : 3210035).	360	Numbers
00840	M-ELBO-00006	90D ELBOW 1.50 B16.11/SW/3000/ASTMA105 . 90D ELBOW 1.50 B16.11/SW/3000/ASTMA105.	150	Numbers
00850	M-ELBO-00007	90DEG ELBOW 16.000 R1.5D 40S WP 316LSHTP 90DEG ELBOW 16.000 R1.5D B-16.9 BW 40S A 403 GR WP 316L (SHTP)	2	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
00860	M-ELBO-00009	90D ELBOW 1.00 B16.11/SW/6000/ASTMA105 . 90D ELBOW 1.00 B16.11/SW/6000/ASTMA105.	40	Numbers
00870	M-ELBO-00021	90D ELBOW 2.00 R1.5D/B16.9/BW/XS/A234WPB 90D ELBOW 2.00 R1.5D/ B16.9/ BW/ XS/ AST M A234 Gr.WPB	100	Numbers
00880	M-ELBO-00023	90D ELBOW 2.00 B16.9/BW/4.5mm/A234WPB 90D ELBOW 2.00 R1.5D/ B16.9/ BW/ 4.5mm/ ASTM A234 Gr.WPB	50	Numbers
00890	M-ELBO-00032	90D ELBOW 8.00 R1.5D/B16.9/BW/S20/ASTMA2 90D ELBOW 8.00 R1.5D/B16.9/BW/S20/ASTMA234GrWPB	55	Numbers
00900	M-ELBO-00034	90D ELBOW 10.00 R1.5D/B16.9/BW/S20/ASTMA 90D ELBOW 10.00 R1.5D/B16.9/BW/S20/ASTMA234GrWPB	30	Numbers
00910	M-ELBO-00035	90D ELBOW 10.00 B16.9/BW/S30/A234WPB 90D ELBOW 10.00 R1.5D/ B16.9/ BW/ S30/ A STM A234 Gr.WPB	10	Numbers
00920	M-ELBO-00041	90D ELBOW 14.00 R1.5D/B16.9/BW/S20/ASTMA 90D ELBOW 14.00 R1.5D/B16.9/BW/S20/ASTMA234GrWPB	15	Numbers
00930	M-ELBO-00041	90D ELBOW 14.00 R1.5D/B16.9/BW/S20/ASTMA 90D ELBOW 14.00 R1.5D/B16.9/BW/S20/ASTMA234GrWPB	20	Numbers
00940	M-ELBO-00047	90D ELBOW 2.00 R1.5D/B16.9/BW/STD/ASTMA2 90D ELBOW 2.00 R1.5D/B16.9/BW/STD/ASTMA234GrWPB	200	Numbers
00950	M-ELBO-00049	90D ELBOW 3.00 R1.5D/B16.9/BW/STD/ASTMA2 90D ELBOW 3.00 R1.5D/B16.9/BW/STD/ASTMA234GrWPB	160	Numbers
00960	M-ELBO-00051	90D ELBOW 4.00 R1.5D/B16.9/BW/STD/ASTMA2 90D ELBOW 4.00 R1.5D/B16.9/BW/STD/ASTMA234GrWPB	250	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
00970	M-ELBO-00066	90D ELBOW 0.50 B16.11/SW/3000/ASTMA105/I 90D ELBOW 0.50 B16.11/SW/3000/ASTMA105/IBR	500	Numbers
00980	M-ELBO-00067	90D ELBOW 0.75 B16.11/SW/3000/ASTMA105/I 90D ELBOW 0.75 B16.11/SW/3000/ASTMA105/IBR	260	Numbers
00990	M-ELBO-00068	90D ELBOW 1.00 B16.11/SW/3000/ASTMA105/I 90D ELBOW 1.00 B16.11/SW/3000/ASTMA105/IBR	210	Numbers
01000	M-ELBO-00069	90D ELBOW 1.50 B16.11/SW/3000/ASTMA105/I 90D ELBOW 1.50 B16.11/SW/3000/ASTMA105/IBR	60	Numbers
01010	M-ELBO-00083	90D ELBOW 2.00 R1.5D/B16.9/BW/STD/ASTMA2 90D ELBOW 2.00 R1.5D/B16.9/BW/STD/ASTMA234GrWPB/IBR	130	Numbers
01020	M-ELBO-00090	90D ELBOW 2.00 R1.5D/B16.9/BW/XS/ASTMA23 90D ELBOW 2.00 R1.5D/B16.9/BW/XS/ASTMA234GrWPB/IBR	120	Numbers
01030	M-ELBO-00102	ELBOW.90, WPB-W, 14.0 INCH, 6.0 MM THK ELBOW.90, B-16.9, ASTM A 234 GR.WPB-W, BW, 1.5D, 14.0 INCH, 6.0 MM THK	2	Numbers
01040	M-ELBO-00126	ELBOW.90,WPB, BW,1.5D, AXN1,4.0 INCH,ST ELBOW.90, B-16.9, ASTM A 234 GR.WPB, BW, 1.5D, AXN1,4.0 INCH,STD	20	Numbers
01050	M-ELBO-00139	ELBOW.90,F304, SW, 3000, 0.5INCH ELBOW.90, B-16.11, ASTM A 182 GR.F304, SW, 3000, 0.5INCH	20	Numbers
01060	M-ELBO-00141	ELBOW.90,F304, SW, 3000, 1.5INCH ELBOW.90, B-16.11, ASTM A 182 GR.F304, SW, 3000, 1.5INCH	20	Numbers
01070	M-ELBO-00145	90D ELBOW 2.00 R1.5D/B16.9/BW/S160/ASTMA 90D ELBOW 2.00 R1.5D/B16.9/BW/S160/ASTMA234GrWPB/H2	30	Numbers
01080	M-ELBO-00151	ELBOW.90,A105, SW, 6000, H2, 0.75 INCH ELBOW.90, B-16.11, ASTM A 105, SW, 6000, H2, 0.75 INCH	10	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
01090	M-ELBO-00170	90DEG ELBOW/28.00/B16.9/BW/A234 GR.WPCW 90DEG ELBOW/28.00/B16.9/10MM/BW/ASTM A234 Gr. WPCW	20	Numbers
01100	M-ELBO-00172	90D ELBOW 12.0/S160/A234 GR WP11 CL1 H2 90D ELBOW 12.0 R1.5D B16.9 BW S160 ASTM A234 GR WP11 CL1 H2	2	Numbers
01110	M-ELBO-00173	45D ELBOW 12.0/S160/A234 GR WP11 CL1 H2 45D ELBOW 12.0 R1.5D B16.9 BW S160 ASTM A234 GR WP11 CL1 H2	2	Numbers
01120	M-ELBO-00191	90DEG ELBOW/4.0/R1.5D/XS/A 234 GRWPB 90DEG ELBOW 4.000 R1.5D B-16.9 BW XS ASTM A 234 GRWPB	100	Numbers
01130	M-ELBO-00205	90D ELBO 0.50 B16.11/SW/3000/ASTMA105/H2 90D ELBOW 0.50 B16.11/SW/3000/ASTMA105/H2	60	Numbers
01140	M-ELBO-00210	90D ELBO 0.75 B16.11/SW/3000/ASTMA105/H2 90D ELBOW 0.750 B16.11/SW/3000/ASTMA105/H2	55	Numbers
01150	M-ELBO-00217	90D ELBO 0.75 SW 3000 ASTM A182 GR.304L 90DEG ELBOW 0.750 B16.11 SW 3000 ASTM A182 GR.304L	12	Numbers
01160	M-ELBO-00224	90D/ELBO/4.0/R1.5D/BW/HVY/A234 GR.WPB/B- 90D/ELBO/4.0/R1.5D/BW/HVY/A234 GR.WPB/B-16.9	56	Numbers
01170	M-ELBO-00226	90D ELBOW/10.0/S60/BW/ASTM A234 GR.WP5/B 90D ELBOW/10.0/S60/BW/ASTM A234 GR.WP5/B 16.9/R1.5D	5	Numbers
01180	M-ELBO-00228	90D ELBOW/3.0/STD/BW/NACE/A234 GR.WPB/AS 90D ELBOW/3.0/STD/BW/NACE/A234 GR.WPB/ASTM A234 GR.WPB	20	Numbers
01190	M-ELBO-00234	90D ELBOW/80NB/SCH XXS/S.R/GR WPB/IBR/SA 90D ELBOW/80NB/SCH XXS/S.R/GR WPB/IBR/SA 234 GR WPB, IBR	20	Numbers
01200	M-ELBO-00235	45D ELBOW/80NB/SCH XXS/S.R/GR WPB/IBR/SA 45D ELBOW/80NB/SCH XXS/S.R/GR WPB/IBR/SA 234 GR WPB, IBR	20	Numbers
01210	M-ELBO-00240	90D Elbow NACE/1/2"/6000#/ASTM A 105/S 90D Elbow NACE/1/2"/6000#/ASTM A 105/SW/B -16.11	200	Numbers
01220	M-ELBO-00241	90D Elbow NACE/3/4"/6000#/ASTM A 105/S 90D Elbow NACE/3/4"/6000#/ASTM A 105/SW/B -16.11	120	Numbers
01230	M-ELBO-00242	90D Elbow LTCS/1/2"/6000#/F5/ASTM A 18 90D Elbow LTCS/1/2"/6000#/F5/ASTM A 182 GR.F5/SW/B -16.11	60	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
01240	M-ELBO-00243	90D Elbow LTCS/3/4"/6000#/F5/ASTM A 18 90D Elbow LTCS/3/4"/6000#/F5/ASTM A 182 GR.F5/SW/B -16.11	36	Numbers
01250	M-ELBO-00244	90D Elbow NACE+H2/1/2"/6000#/ASTM A 10 90D Elbow NACE+H2/1/2"/6000#/ASTM A 105/SW/B -16.11	40	Numbers
01260	M-ELBO-00245	90D Elbow NACE+H2/3/4"/6000#/ASTM A 10 90D Elbow NACE+H2/3/4"/6000#/ASTM A 105/SW/B -16.11	24	Numbers
01270	M-ELBO-00246	90D Elbow NACE/1/2"/9000#/ASTM A 105/S 90D Elbow NACE/1/2"/9000#/ASTM A 105/SW/B -16.11	20	Numbers
01280	M-ELBO-00247	90D Elbow NACE/3/4"/9000#/ASTM A 105/S 90D Elbow NACE/3/4"/9000#/ASTM A 105/SW/B -16.11	20	Numbers
01290	M-ELBO-00249	90D ELBOW 1.00 B16.11/SW/3000/ASTMA182Gr 90D ELBOW 1.00 B16.11/SW/3000/ASTMA182GrF11/IBR	55	Numbers
01300	M-ELBO-00250	90D Elbow NACE/1/2"/XXS/ASTM 234 GR. W 90D Elbow NACE/1/2"/XXS/ASTM 234 GR. WPB/BW/B -16.11	20	Numbers
01310	M-ELBO-00251	90D Elbow NACE/3/4"/XXS/ASTM 234 GR. W 90D Elbow NACE/3/4"/XXS/ASTM 234 GR. WPB/BW/B -16.11	20	Numbers
01320	M-ELBO-00252	90D Elbow H2 Service/1/2"/XXS/ASTM 234 90D Elbow H2 Service/1/2"/XXS/ASTM 234 GR. WPB/BW/B -16.9	20	Numbers
01330	M-ELBO-00253	90D Elbow H2 Service/3/4"/XXS/ASTM 234 90D Elbow H2 Service/3/4"/XXS/ASTM 234 GR. WPB/BW/B -16.9	20	Numbers
01340	M-ELBO-00254	90D Elbow/1/2"/3000#/A182 GR. F304L/SW 90D Elbow/1/2"/3000#/A182 GR. F304L/SW/B -16.11	40	Numbers
01350	M-ELBO-00255	90D Elbow LTCS/1/2"/6000#/F11/ASTM A 1 90D Elbow LTCS/1/2"/6000#/F11/ASTM A 182 GR.F11/SW/B -16.11	20	Numbers
01360	M-ELBO-00257	90D Elbow LTCS/3/4"/6000#/F11/ASTM A 1 90D Elbow LTCS/3/4"/6000#/F11/ASTM A 182 GR.F11/SW/B -16.11	20	Numbers
01370	M-ELBO-00260	45D ELBO/10/BW/SCH 34.0/A 403 GR.WP316 L 45D ELBO/10/BW/SCH 34.0/A 403 GR.WP316 LWX (SHTP)/R 1.50/B16.9	4	Numbers
01380	M-ELBO-00261	45D ELBO/10/BW/SCH 34.0/A 403 GR.WP316 L 90D ELBO/10/BW/SCH 34.0/A 403 GR.WP316 LWX (SHTP)/B16.9/R 1.50	7	Numbers
01390	M-ELBO-00262	90D ELBO/12.0/BW/R1.50/B16.9/S140/WP11 A 90D ELBO/12.0/BW/R1.50/B16.9/S140/WP11 ASTM A234 GR WP11 CL1 H2	2	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
01400	M-ELBO-00263	90D ELBO/18.0/BW/R1.50/B16.9/S140/WP11 A 90D ELBO/18.0/BW/R1.50/B16.9/S140/WP11 ASTM A234 GR WP11 CL1 H2	1	Numbers
01410	M-ELBO-00264	90D ELBO/2.0 /WP5/BW/XS/ASTM A234 GR.WP5 90D ELBO/2.0 /WP5/BW/XS/ASTM A234 GR.WP5/R1.5D/B16.9	20	Numbers
01420	M-ELBO-00433	45D ELBOW 2.00 R1.5D/B16.9/BW/STD/ASTMA2 45D ELBOW 2.00 R1.5D/B16.9/BW/STD/ASTMA234GrWPB	30	Numbers
01430	M-ELBO-00603	90D ELBOW 3.00/150/SS304 . 90D ELBOW 3.00/150/SS304.	20	Numbers
01440	M-ELBO-00653	45D Elbow 0.50" B16.11/SW/3000/ ASTM A 18 45D Elbow 0.50" B16.11/SW/3000/ ASTM A 182; Gr. F304	15	Numbers
01450	M-ELBO-00661	90D ELBOW 6.00 R1.5D/B16.9/BW/STD/A234Gr 90D ELBOW 6.00 R1.5D/B16.9/BW/STD/A234Gr.WPB/IBR	25	Numbers
01460	M-ELBO-00679	90 deg Elbow; 08.00" A 234 Gr. WPBW 08.00"; 90 deg. Elbow; 6.35 mm thk.; Material : A 234 Gr. WPBW; DIM STD: B 16.9; END/FACING: BW.	20	Numbers
01470	M-ELBO-00684	45 deg Elbow; 08.00" A 234 Gr. WPBW 08.00"; 45 deg. Elbow; 6.35 mm thk.; Material : A 234 Gr. WPBW; DIM STD: B 16.9; END/FACING: BW.	15	Numbers
01480	M-ELBO-00693	90 D Elbo 2.0/S10/1.5D/BW/ASTM A403WP304 90 Deg Elbo 2.0/Sch.10/1.5D/BW/B16.9/ASTM A403GR.WP304	10	Numbers
01490	M-ELBO-00702	ELBOW.90 A 105 SW 6000 0.5 INCH ELBOW.90 B-16.11 ASTM A 105 SW 6000 0.5 INCH WA602D3Z004ZZZZZZ	250	Numbers
01500	M-ELBO-00703	ELBOW.90 A 105 SW 6000 0.75 INCH ELBOW.90 B-16.11 ASTM A 105 SW 6000 0.75 INCH WA602D3Z005ZZZZZZ	225	Numbers
01510	M-ELBO-00707	ELBOW.90 A 105 SW 6000 H2 1.5 INCH ELBOW.90 B-16.11 ASTM A 105 SW 6000 H2 1.5 INCH WA602D3Z708ZZZZZZ	50	Numbers
01520	M-ELBO-00710	ELBOW.90 F11 CL.2 SW 3000 H2 1.5 IN	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
	ELBOW.90 B-16.11	ASTM A 182 GR.F11 CL.2 SW 3000 H2 1.5 INCH WA638D2Z708ZZZZZZ		
01530	M-ELBO-00717	ELBOW.90 A 182 GR.F5 SW 6000 0.75 IN ELBOW.90 B-16.11 ASTM A 182 GR.F5 SW 6000 0.75 INCH WA652D3Z005ZZZZZZ	24	Numbers
01540	M-ELBO-00724	ELBOW.90 A 234 P11 BW 1.5D H2 6.0 IN XS ELBOW.90 B-16.9 ASTM A 234 GR.WP11 CL.1 BW 1.5D H2 6.0 INCH XS WAG564Z171519ZZZZ	15	Numbers
01550	M-ELBO-00726	ELBOW.90 A 234 GR.WP11 BW H2 8.0 IN XS ELBOW.90 B-16.9 ASTM A 234 GR.WP11 CL.1 BW 1.5D H2 8.0 INCH XS WAG564Z171619ZZZZ	10	Numbers
01560	M-ELBO-00735	ELBOW.90 A 234 GR.WPB BW 12.0 INCH STD ELBOW.90 B-16.9 ASTM A 234 GR.WPB BW 1.5D 12.0 INCH STD WAG684Z101818ZZZZ	1	Numbers
01570	M-ELBO-00739	ELBOW.90 A 234 BW 1.5D IBR 3.0 INCH ELBOW.90 B-16.9 ASTM A 234 GR.WPB BW 1.5D IBR 3.0 INCH STD WAG684Z111118ZZZZ	10	Numbers
01580	M-ELBO-00768	ELBOW.90P316L-S BW 1.5D 14.0 IN S40 ELBOW.90 B-16.9 ASTM A 403 GR.WP316L-S BW 1.5D 14.0 INCH S40 WAGA34Z101904ZZZZ	1	Numbers
01590	M-ELBO-00771	ELBOW.90 BW 1.5D H2 16.0 INC 42.0 MM ELBOW.90 B-16.9 ASTM A 403 GR.WP321-WX BW 1.5D H2 16.0 INCH 42.0 MM THK WAGA74Z1720B7ZZZZ	2	Numbers
01600	M-ELBO-00777	ELBOW.45 A 105 SW 3000 0.75 INCH ELBOW.45 B-16.11 ASTM A 105 SW 3000 0.75 INCH WB602D2Z005ZZZZZZ	30	Numbers
01610	M-ELBO-00778	ELBOW.45 ASTM A 105 SW 3000 1.0 INCH ELBOW.45 B-16.11 ASTM A 105 SW 3000 1.0 INCH WB602D2Z006ZZZZZZ	20	Numbers
01620	M-ELBO-00826	ELBOW.45 A 403 GR.WP316L-S 16.0 IN S40 ELBOW.45 B-16.9 ASTM A 403 GR.WP316L-S BW 1.5D 16.0 INCH S40 WBGA34Z102004ZZZZ	2	Numbers
01630	M-ELBO-00830	ELBOW.90 A 234 GR.WPB BW 3.0 IN STD ELBOW.90 B-16.9 ASTM A 234 GR.WPB BW 1.5D H2 3.0 INCH STD WAG684Z171118ZZZZ	40	Numbers
01640	M-ELBO-00841	90D ELBOW 0.75/SW/3000/A182GrF316L 90D ELBOW 0.75 B16.11/SW/3000/ASTMA182GrF316L	18	Numbers
01650	M-ELBO-00843	90 D ELBOW/6.0/BW/HVY/B16.9/A234 Gr.WPB	30	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		90 Deg. ELBOW/6.0/BW/HVY/LR/B16.9/ASTM A234 Gr. WPB/SMLS		
01660	M-ELBO-00844	90D/ELBO/8.0/B16.9/WN/ASTMA403GRWP316LWX 90D/ELBO/8.0/R-1.5D/B16.9/ASTM A403 GR WP316LWX	10	Numbers
01670	M-ELBO-00864	90D ELBOW/3.00/BW/HVY/ASTMA234GrWPB 90D ELBOW 3.00 R1.5D/B16.9/BW/HVY/ASTMA234GrWPB	25	Numbers
01680	M-ELBO-00865	90D ELBOW/8.00/BW/S20/A234Gr.WPB/IBR 90D ELBOW 8.00 R1.5D/B16.9/BW/S20/A234Gr.WPB/IBR	2	Numbers
01690	M-ELBO-00892	90D ELBOW/0.50/SW/3000/ASTM A182GR.F316L 90D ELBOW/0.50/B16.11/SW/3000/ASTM A182GR.F316L	60	Numbers
01700	M-ELBO-00916	90D ELBOW 28.00 R1.5D/B16.9/BW/XS/A234 ELBOW.90, B-16.9, ASTM A 234 GR.WPB, BW, 1.5D, 28.0 INCH, XS	2	Numbers
01710	M-ELBO-00918	90D ELBOW/4.00/BW/Sch.XS/A234GrWPB/NACE 90D ELBOW/4.00/1.5D/B16.9/BW/XS/ASTM A234 Gr. WPB/NACE	40	Numbers
01720	M-ELBO-00926	90D ELBOW/10.00/S140/A234Gr.WPB/NORM/H2 90D ELBOW/10.00/1.5D/B16.9/BW/S140/ASTM A234 Gr.WPB/NORM/H2	2	Numbers
01730	M-ELBO-00927	90D ELBOW 4.00 BW 10S SS316L-S 90D ELBOW, 4.0", 10S, BW, R=1.50, B 16.9, ASTM A403 GR. WP 316L-S	13	Numbers
01740	M-ELBO-00928	90D ELBOW 3.00 BW 10S SS316L 90D ELBOW, 3.0", 10S, BW, R=1.50, B 16.9, ASTM A403 GR. WP 316L	20	Numbers
01750	M-ELBO-00929	90D ELBOW 6.00 BW 10S SS316L-S 90D ELBOW, 6.0", 10S, BW, R=1.50, B 16.9, ASTM A403 GR. WP 316L-S	15	Numbers
01760	M-ELBO-00952	90D/ ELBO/0.50/SW/6000/A182 GR.F5 90DEG ELBOW 0.500 B-16.11 SW 6000 ASTM A182 GR.F5	50	Numbers
01770	M-ELBO-00979	45D ELBOW 20.00/12mm/B16.9 ASTMA234WPB-W 45D ELBOW 20.00/12mm/B16.9 ASTMA234WPB-W	5	Numbers
01780	M-ELBO-00980	45D ELBOW 28.00/12mm/B16.9 ASTMA234WPB-W 45D ELBOW 28.00/12mm/B16.9 ASTMA234WPB-W	6	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
01790	M-ELBO-00982	90D Elbo 2.0 R1.5D/BW/10S/A403Gr.WP316L 90 D Elbow 2.0" R1.5D/BW/B16.9/Sch.10S/Minimum Wall Thickness 2.77 mm/ASTM A403 Gr.WP316L	34	Numbers
01800	M-ELBO-00983	90D Elbo 4.0 R1.5D/BW/10S/A403 WP316L-S 90 D Elbow 4.0" R1.5D/BW/B16.9/Sch.10S/Minimum Wall Thickness 3.05 mm/ASTM A403 Gr.WP316L-S	30	Numbers
01810	M-ELBO-00984	90D Elbo 6.0 R1.5D/BW/10S/A403WP316L-S 90 D Elbow 6.0" R1.5D/BW/B16.9/Sch.10S/Minimum Wall Thickness 3.40 mm/ASTM A403 Gr.WP316L-S	30	Numbers
01820	M-FLAN-00010	FLNG.WN,F304, 150, RF, 0.75 INCH, 80S" FLNG.WN, B-16.5, ASTMA 182 GR.F304, 150, RF/125AARH, 0.75 INCH, 80S	20	Numbers
01830	M-FLAN-00020	SW FLANGE 0.50 SERR.FIN/B16.5/RF/150/XS/ SW FLANGE 0.50 SERR.FIN/B16.5/RF/150/XS/ASTMA105	200	Numbers
01840	M-FLAN-00021	SW FLANGE 0.75 SERR.FIN/B16.5/RF/150/XS/ SW FLANGE 0.75 SERR.FIN/B16.5/RF/150/XS/ASTMA105	200	Numbers
01850	M-FLAN-00022	SW FLANGE 1.00 SERR.FIN/B16.5/RF/150/XS/ SW FLANGE 1.00 SERR.FIN/B16.5/RF/150/XS/ASTMA105	100	Numbers
01860	M-FLAN-00023	SW FLANGE 1.50 SERR.FIN/B16.5/RF/150/XS/ SW FLANGE 1.50 SERR.FIN/B16.5/RF/150/XS/ASTMA105	120	Numbers
01870	M-FLAN-00024	SW FLANGE 0.50 125AARH/B16.5/RF/300/XS/A SW FLANGE 0.50 125AARH/B16.5/RF/300/XS/ASTMA105	250	Numbers
01880	M-FLAN-00025	SW FLANGE 0.75 125AARH/B16.5/RF/300/XS/A SW FLANGE 0.75 125AARH/B16.5/RF/300/XS/ASTMA105	350	Numbers
01890	M-FLAN-00026	SW FLANGE 1.00 125AARH/B16.5/RF/300/XS/A SW FLANGE 1.00 125AARH/B16.5/RF/300/XS/ASTMA105	350	Numbers
01900	M-FLAN-00027	SW FLANGE 1.50 125AARH/B16.5/RF/300/XS/A SW FLANGE 1.50 125AARH/B16.5/RF/300/XS/ASTMA105	250	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
01910	M-FLAN-00053	SW FLANGE 0.50 125AARH/B16.5/RF/600/XS/A SW FLANGE 0.50 125AARH/B16.5/RF/600/XS/ASTMA105	200	Numbers
01920	M-FLAN-00067	SW FLANGE 0.50 125AARH/B16.5/RF/300/XS/A SW FLANGE 0.50 125AARH/B16.5/RF/300/XS/ASTMA105/IBR	200	Numbers
01930	M-FLAN-00068	SW FLANGE 0.75 125AARH/B16.5/RF/300/XS/A SW FLANGE 0.75 125AARH/B16.5/RF/300/XS/ASTMA105/IBR	100	Numbers
01940	M-FLAN-00070	SW FLANGE 1.50 125AARH/B16.5/RF/300/XS/A SW FLANGE 1.50 125AARH/B16.5/RF/300/XS/ASTMA105/IBR	40	Numbers
01950	M-FLAN-00072	SW FLANGE 0.75 125AARH/B16.5/RF/600/XS/A SW FLANGE 0.75 125AARH/B16.5/RF/600/XS/ASTMA105/IBR	40	Numbers
01960	M-FLAN-00073	SW FLANGE 1.00 125AARH/B16.5/RF/600/XS/A SW FLANGE 1.00 125AARH/B16.5/RF/600/XS/ASTMA105/IBR	40	Numbers
01970	M-FLAN-00077	FLNG.WN,A105, 150, RF, AXN1, 0.75",S16 FLNG.WN, B-16.5, ASTMA 105, 150, RF/125AARH, AXN1, 0.75 INCH,S160	20	Numbers
01980	M-FLAN-00081	FLNG.WN,A105, 150, RF, AXN1, 4.0", STD FLNG.WN, B-16.5, ASTMA 105, 150, RF/125AARH, AXN1, 4.0 INCH, STD	20	Numbers
01990	M-FLAN-00091	FLNG.WN,A105, 150, RF, H2, 0.75", S160 FLNG.WN, B-16.5, ASTMA 105, 150, RF/125AARH, H2, 0.75 INCH, S160	20	Numbers
02000	M-FLAN-00093	FLNG.WN,A105, 150, RF, H2, 2.0", XS FLNG.WN, B-16.5, ASTMA 105, 150, RF/125AARH, H2, 2.0 INCH, XS	20	Numbers
02010	M-FLAN-00116	SW FLANGE 1.50 125AARH/B16.5/RF/600XSAST SW FLANGE 1.50 125AARH/B16.5/RF/600XSASTMA182GrF11/IBR	25	Numbers
02020	M-FLAN-00157	FLNG.FIG.8, F304, 150, FF, 1.5 INCH" FLNG.FIG.8, ASME-B16.48, ASTM A 182 GR.F304, 150, FF/125AARH, 1.5 INCH	15	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
02030	M-FLAN-00170	WN FLANGE 3.00 125AARH/B16.5/RF/300/STD/ WN FLANGE 3.00 125AARH/B16.5/RF/300/STD/ASTMA105	70	Numbers
02040	M-FLAN-00173	WN FLANGE 6.00 125AARH/B16.5/RF/300/STD/ WN FLANGE 6.00 125AARH/B16.5/RF/300/STD/ASTMA105	20	Numbers
02050	M-FLAN-00175	WN FL 8.00 125AARH/B16.5/XS/600/F11/IBR WN FLANGE 8.00 RF/125AARH/B16.5/SCH. 80/600# ASTM A 182 Gr. F11 IBR	2	Numbers
02060	M-FLAN-00179	WN FLANGE 2.00 SER.FIN/B16.5/RF/150/XS/A WN FLANGE 2.00 SER.FIN/B16.5/RF/150/XS/ASTMA105	60	Numbers
02070	M-FLAN-00182	WN FLANGE 4.00 SER.FIN/B16.5/RF/150/STD/ WN FLANGE 4.00 SER.FIN/B16.5/RF/150/STD/ASTMA105	150	Numbers
02080	M-FLAN-00183	WN FLANGE 6.00 SER.FIN/B16.5/RF/150/STD/ WN FLANGE 6.00 SER.FIN/B16.5/RF/150/STD/ASTMA105	90	Numbers
02090	M-FLAN-00196	FLNG.FIG.8, A105, 150, FF, 1.0 INCH" FLNG.FIG.8, ASME-B16.48, ASTM A 105, 150, FF/125AARH, 1.0 INCH	20	Numbers
02100	M-FLAN-00211	WN FLANGE 2.00 SER.FIN/B16.5/RF/150/STD/ WN FLANGE 2.00 SER.FIN/B16.5/RF/150/STD/ASTMA105	100	Numbers
02110	M-FLAN-00219	WN FLANGE 2.50 SER.FIN/B16.5/RF/150/STD/ WN FLANGE 2.50 SER.FIN/B16.5/RF/150/STD/ASTMA105	20	Numbers
02120	M-FLAN-00234	WN FLANGE 3.00 125AARH/B16.5/RF/150/STD/ WN FLANGE 3.00 125AARH/B16.5/RF/150/STD/ASTMA105	80	Numbers
02130	M-FLAN-00254	FLNG.BLIND,A105, 150, RF, H2,0.75" FLNG.BLIND, B-16.5, ASTM A 105, 150, RF/125AARH, H2,0.75 INCH	20	Numbers
02140	M-FLAN-00256	FLNG.BLIND,A105, 150, RF, AXN1, 0.75" FLNG.BLIND, B-16.5, ASTM A 105, 150, RF/125AARH, AXN1, 0.75 INCH	20	Numbers
02150	M-FLAN-00285	WN FLANGE/12/1500/RTJ/S140/A105/NORM/H2	1	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		WN FLANGE 12.000 B-16.5 RTJ 1500 S140 ASTM A105 (NORM) H2		
02160	M-FLAN-00315	WN FLANGE/4.0/600#/RF/XS/A182GR.F11/IBR WN FLANGE/4.0 Inch X 600#/ANSI B16.5/RF/125AARH/XS/ASTM A182 GR.F11/IBR	5	Numbers
02170	M-FLAN-00355	WN FLANGE 2.00 SER.FIN/B16.5/RF/150/STD/ WN FLANGE 2.00 SER.FIN/B16.5/RF/150/STD/ASTMA105/IBR	40	Numbers
02180	M-FLAN-00369	WN FLANGE 1.50 125AARH/B16.5/RF/600/XS/A WN FLANGE 1.50 125AARH/B16.5/RF/600/XS/ASTMA105/IBR	30	Numbers
02190	M-FLAN-00382	WN FLG 12.0 RF/600/S80/A182 GR.F11/IBR WN FLG 12.000 125 AARH B-16.5 RF 600S80 ASTM A182 GR.F11 IBR	3	Numbers
02200	M-FLAN-00383	WN FLNG.10"/300#/RTJ/S60/A182 Gr.F5/63AA WN FLNG.10"/300# /RTJ/S60/A182 Gr.F5/ 63AARH/	25	Numbers
02210	M-FLAN-00403	WN FLNG.8"/300# /RTJ/S60/A182 Gr.F5/63AA WN FLNG.8"/300# /RTJ/S60/A182 Gr.F5/ 63AARH/	15	Numbers
02220	M-FLAN-00439	BL Flange/0.75/RF/300/A 182 GR.F316L /B BL Flange/0.75/RF/300/A 182 GR.F316L /B - 16.5	20	Numbers
02230	M-FLAN-00443	FLNG.WN 1.50/S160/ASTM A105/600/RF/IBR/1 FLNG.WN 1.50/S160/ASTM A105/600/RF/IBR/125 AARH/B 16.5	20	Numbers
02240	M-FLAN-00454	SW Flange NACE/1/2"/150#/ASTM A 105/RF SW Flange NACE/1/2"/150#/ASTM A 105/RF/B - 16.5	70	Numbers
02250	M-FLAN-00455	SW Flange LTCS/1/2"/300#/F5/ASTM A 182 SW Flange LTCS/1/2"/300#/F5/ASTM A 182 GR.F5/RF/B - 16.5	26	Numbers
02260	M-FLAN-00456	SW Flange NACE + H2/1/2"/300#/ASTM A 1 SW Flange NACE + H2/1/2"/300#/ASTM A 105/RF/B - 16.5	32	Numbers
02270	M-FLAN-00457	SW Flange NACE/1/2"/300#/ASTM A 105/RF SW Flange NACE/1/2"/300#/ASTM A 105/RF/B - 16.5	20	Numbers
02280	M-FLAN-00458	SW Flange NACE/1/2"/600#/ASTM A 105/RF SW Flange NACE/1/2"/600#/ASTM A 105/RF/B - 16.5	20	Numbers
02290	M-FLAN-00459	SW Flange NACE + H2/1/2"/600#/ASTM A 1	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		SW Flange NACE + H2/1/2"/600#/ASTM A 105/RF/B - 16.5		
02300	M-FLAN-00460	SW Flange/1/2"/300#/A182 GR. F304L/RF/ SW Flange/1/2"/300#/A182 GR. F304L/RF/B - 16.5	20	Numbers
02310	M-FLAN-00461	SW Flange LTCS/1/2"/300#/F11/ASTM A 18 SW Flange LTCS/1/2"/300#/F11/ASTM A 182 GR.F11/RF/B - 16.5	20	Numbers
02320	M-FLAN-00462	WN Flange NACE/1/2"/1500#/ASTM A 105/R WN Flange NACE/1/2"/1500#/ASTM A 105/RTJ/B - 16.5	20	Numbers
02330	M-FLAN-00463	WN Flange H2 Service/1/2"/1500#/ASTM A WN Flange H2 Service/1/2"/1500#/ASTM A 105/RTJ/B - 16.5	20	Numbers
02340	M-FLAN-00464	BL FLNG/6.0/RTJ/1500/S160/ASTMA105/H2/B1 BL FLNG/6.0/RTJ/1500/S160/ASTMA105/H2/B16.5	10	Numbers
02350	M-FLAN-00465	BL FLNG/0.75/B-16.5/RF/150/GR.304 /ASTM BL FLNG/0.75/B-16.5/RF/150/GR.304 /ASTM A182 GR.304	20	Numbers
02360	M-FLAN-00466	BL FLNG/0.50/B-16.5/RF/300/GR.304 /ASTM BL FLNG/0.50/B-16.5/RF/300/GR.304 /ASTM A182 GR.304	20	Numbers
02370	M-FLAN-00467	SW FLNG/RTJ/0.75/ H2/600/SCH 160/F11 /A1 SW FLNG/RTJ/0.75/ H2/600/SCH 160/F11 /A182 Gr F11	20	Numbers
02380	M-FLAN-00468	WN FLNG/12.00/B16.5/RF/300/STD/F11/H2/AS WN FLNG/12.00/B16.5/RF/300/STD/F11/H2/ASTM A182 Gr 11/H2	2	Numbers
02390	M-FLAN-00469	WN FLNG/1.50/125 AARH/XXS/RF/150/A105 WN FLNG/1.50/125 AARH/XXS/RF/150/A105	32	Numbers
02400	M-FLAN-00470	WN FLNG/2.0/125 AARH/XXS/RF/150/A105 WN FLNG/2.0/125 AARH/XXS/RF/150/A105	20	Numbers
02410	M-FLAN-00471	WN FLNG/14.0/125 AARH/S60/RF/150/A105 WN FLNG/14.0/125 AARH/S60/RF/150/A105	10	Numbers
02420	M-FLAN-00472	WN FLNG/24.0/IBR/ASTM A105/B-16.5 WN FLNG/24.0/IBR/ASTM A105/B-16.5	3	Numbers
02430	M-FLAN-00473	WN FLNG/12.0/B-16.5/RTJ/300/STD/H2/F11/A WN FLNG/12.0/B-16.5/RTJ/300/STD/H2/F11/ASTM A182 Gr 11	2	Numbers
02440	M-FLAN-00474	WN FLNG/1.5/ASTM A182 GR.304/150/40S/RF/ WN FLNG/1.5/ASTM A182 GR.304/150/40S/RF/B-16.5	20	Numbers
02450	M-FLAN-00475	WN FLNG/1.5/ASTM A182 GR.304/300/40S/RF/	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		WN FLNG/1.5/ASTM A182 GR.304/300/40S/RF/B-16.5		
02460	M-FLAN-00476	WN FLNG/3.0/300/10S/F316L/ASTM A 182 GR. WN FLNG/3.0/300/10S/F316L/ASTM A 182 GR.F316L/ B-16.5	28	Numbers
02470	M-FLAN-00516	WN FLANGE 2.00 125AARH/B16.5/RF/300/STD/ WN FLANGE 2.00 125AARH/B16.5/RF/300/STD/ASTMA105	150	Numbers
02480	M-FLAN-00574	WN FLANGE 0.50 B16.5/RTJ/2500/S160/A182G WN FLANGE 0.50 B16.5/RTJ/2500/S160/A182GrF321/SHTP/H2	20	Numbers
02490	M-FLAN-00584	SO FLANGE 2.00 SER.FIN/B16.5/RF/150/S40 SO FLANGE 2.00 SER.FIN/B16.5/RF/150/S40ASTMA105	50	Numbers
02500	M-FLAN-00586	SO FLANGE 3.00 SER.FIN/B16.5/RF/150/STD SO FLANGE 3.00 SER.FIN/B16.5/RF/150/STDASTMA105	100	Numbers
02510	M-FLAN-00589	SO FLANGE 6.00 SER.FIN/B16.5/RF/150/ASTM SO FLANGE 6.00 SER.FIN/B16.5/RF/150/ASTMA105	160	Numbers
02520	M-FLAN-00590	SO FLANGE 8.00 SER.FIN/B16.5/RF/150/ASTM SO FLANGE 8.00 SER.FIN/B16.5/RF/150/ASTMA105	80	Numbers
02530	M-FLAN-00591	SO FLANGE 10.00 SER.FIN/B16.5/RF/150/AST SO FLANGE 10.00 SER.FIN/B16.5/RF/150/ASTMA105	40	Numbers
02540	M-FLAN-00592	SO FLANGE 12.00 SER.FIN/B16.5/RF/150/AST SO FLANGE 12.00 SER.FIN/B16.5/RF/150/ASTMA105	40	Numbers
02550	M-FLAN-00606	SO FLANGE 26.00 SER.FIN/EILSTD/FF/150/AS SO FLANGE 26.00 SER.FIN/EILSTD/FF/150/ASTMA285GR.C	5	Numbers
02560	M-FLAN-00621	BL FLANGE 0.75 SER.FIN/B16.5/RF/150/ASTM BL FLANGE 0.75 SER.FIN/B16.5/RF/150/ASTMA105	150	Numbers
02570	M-FLAN-00623	BL FLANGE 1.00 SER.FIN/B16.5/RF/150/ASTM BL FLANGE 1.00 SER.FIN/B16.5/RF/150/ASTMA105	40	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
02580	M-FLAN-00626	BL FLANGE 1.50 125AARH/B16.5/RF/150/ASTM BL FLANGE 1.50 125AARH/B16.5/RF/150/ASTMA105	30	Numbers
02590	M-FLAN-00627	BL FLANGE 2.00 SER.FIN/B16.5/RF/150/ASTM BL FLANGE 2.00 SER.FIN/B16.5/RF/150/ASTMA105	30	Numbers
02600	M-FLAN-00633	BL FLANGE 6.00 SER.FIN/B16.5/RF/150/ASTM BL FLANGE 6.00 SER.FIN/B16.5/RF/150/ASTMA105	30	Numbers
02610	M-FLAN-00645	BL FLANGE 0.50 125AARH/B16.5/RF/300/ASTM BL FLANGE 0.50 125AARH/B16.5/RF/300/ASTMA105	40	Numbers
02620	M-FLAN-00646	BL FLANGE 0.75 125AARH/B16.5/RF/300/ASTM BL FLANGE 0.75 125AARH/B16.5/RF/300/ASTMA105	35	Numbers
02630	M-FLAN-00647	BL FLANGE 1.00 125AARH/B16.5/RF/300/ASTM BL FLANGE 1.00 125AARH/B16.5/RF/300/ASTMA105	80	Numbers
02640	M-FLAN-00648	BL FLANGE 1.50 125AARH/B16.5/RF/300/ASTM BL FLANGE 1.50 125AARH/B16.5/RF/300/ASTMA105(EIL Item Code : 0710599).	20	Numbers
02650	M-FLAN-00649	BL FLANGE 2.00 125AARH/B16.5/RF/300/ASTM BL FLANGE 2.00 125AARH/B16.5/RF/300/ASTMA105	30	Numbers
02660	M-FLAN-00650	BL FLANGE 3.00 125AARH/B16.5/RF/300/ASTM BL FLANGE 3.00 125AARH/B16.5/RF/300/ASTMA105	20	Numbers
02670	M-FLAN-00673	BL FLANGE 3.00X2.00 SER.FIN/EILSTD/RF/15 BL FLANGE 3.00X2.00 SER.FIN/EILSTD/RF/150/ASTMA105	50	Numbers
02680	M-FLAN-00675	BL FLANGE 4.00X3.00 SER.FIN/EILSTD/RF/15 BL FLANGE 4.00X3.00 SER.FIN/EILSTD/RF/150/ASTMA105	150	Numbers
02690	M-FLAN-00761	BL FLANGE 0.50 125AARH/B16.5/RF/600/ASTM BL FLANGE 0.50 125AARH/B16.5/RF/600/ASTMA105/IBR	50	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
02700	M-FLAN-00762	BL FLANGE 0.75 125AARH/B16.5/RF/600/ASTM BL FLANGE 0.75 125AARH/B16.5/RF/600/ASTMA105/IBR	50	Numbers
02710	M-FLAN-00765	BL FLANGE 2.00 125AARH/B16.5/RF/600/ASTM BL FLANGE 2.00 125AARH/B16.5/RF/600/ASTMA105/IBR	30	Numbers
02720	M-FLAN-00836	BL FLANGE 0.75 125AARH/B16.5/RF/150/ASTM BL FLANGE 0.75 125AARH/B16.5/RF/150/ASTMA182GrF304	30	Numbers
02730	M-FLAN-00890	Fig.8 Flange 2.00 SERR.FIN/API590/FF/150 Fig.8 Flange 2.00 SERR.FIN/API590/FF/150/ASTM A 105	20	Numbers
02740	M-FLAN-01166	SO Flange; 14.00"; 150#; A105; RF 14.00" SO Flange; 150#; Material: A 105 DIM STD. : B16.5 END/FACING : RF	5	Numbers
02750	M-FLAN-01167	SO Flange; 04.00"; 150#; A105; RF 04.00" SO Flange; 150#; Material: A 105 DIM STD. : B16.5 END/FACING : RF	80	Numbers
02760	M-FLAN-01168	BL FLANGE,8.00",SER.FIN,RF,150,A105. BL FLANGE,8.00",SERR.FIN,B16.5,RF,150,ASTM A 105.	30	Numbers
02770	M-FLAN-01172	Blind flange 12.00/RF/150/ A 105 Blind flange 12.00/RF/150/ A 105	25	Numbers
02780	M-FLAN-01176	SW FL,0.75",SER.FIN,RF,150,XS,A105,IBR SW FLANGE,0.75",SERR.FIN,B16.5,RF,150,XS,ASTM A 105,IBR.	60	Numbers
02790	M-FLAN-01179	BL FLANGE,0.75",SER.FIN,RF,150,A105,IBR BL FLANGE,0.75",SERR.FIN,B16.5,RF,150,ASTM A 105,IBR.	60	Numbers
02800	M-FLAN-01200	FLNG.BLIND ASTM A 105 150 4.0 INCH FLNG.BLIND B-16.5 ASTM A 105 150 RF/125AARH 4.0 INCH FBC0127Z013ZZZZZZ	20	Numbers
02810	M-FLAN-01213	FLNG.BLIND ASTM A 105 300 RF 4.0 INCH FLNG.BLIND B-16.5 ASTM A 105 300 RF/125AARH 4.0 INCH	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
	FBC0147Z013ZZZZZZ			
02820	M-FLAN-01237	FLNG.BLIND A182 GR.F11 600RTJ H2 0.75 IN FLNG.BLIND B-16.5 ASTM A 182 GR.F11 CL.2 600 RTJ/63AARH H2 0.75 INCH FBC3769Z705ZZZZZZ	10	Numbers
02830	M-FLAN-01299	0.5", FLANGE. SW 300,A105,S160,B16.5 0.5",FLANGE. SOCKET WELDED,300#, RF/ 125 AARH, ASTM A 105, SCH.S160, B-16.5	20	Numbers
02840	M-FLAN-01314	FLNG.SW A 105 600 IBR 0.5 INCH S160 FLNG.SW B-16.5 ASTM A 105 600 RF/125AARH IBR 0.5 INCH S160 FSC0167Z10410ZZZZ	25	Numbers
02850	M-FLAN-01321	FLNG.SW A182 GR.F304 300 0.5 INCH 80S FLNG.SW B-16.5 ASTM A 182 GR.F304 300 RF/125AARH 0.5 INCH 80S FSC4147Z00414ZZZZ	20	Numbers
02860	M-FLAN-01355	FLNG.WN A 105 150 1.0 INCH XS FLNG.WN B-16.5 ASTM A 105 150 RF/125AARH 1.0 INCH XS	30	Numbers
02870	M-FLAN-01358	FLNG.WN A 105 150 10.0 INCH STD FLNG.WN B-16.5 ASTM A 105 150 RF/125AARH 10.0 INCH SCH STD	2	Numbers
02880	M-FLAN-01398	FLNG.WN A 105 300 H2 3.0 INCH STD FLNG.WN B-16.5 ASTM A 105 300 RF/125AARH H2 3.0 INCH STD FWC0147Z71118ZZZZ	40	Numbers
02890	M-FLAN-01399	4",FLANGE. WN ,300 A105, STD, B16.5 4",FLANGE. WELD NECK,300#, RF/ 125 AARH, ASTM A 105, SCH.STD, B-16.5	30	Numbers
02900	M-FLAN-01409	FLNG.WN A 105 600 IBR 2.0 INCH XS FLNG.WN B-16.5 ASTM A 105 600 RF/125AARH IBR 2.0 INCH XS FWC0167Z10919ZZZZ	50	Numbers
02910	M-FLAN-01412	FLNG.WN A 105 600 IBR 4.0 INCH XS FLNG.WN B-16.5 ASTM A 105 600 RF/125AARH IBR 4.0 INCH XS FWC0167Z11319ZZZZ	10	Numbers
02920	M-FLAN-01495	FLNG.WN A 105 150, 4.0 INCH SCH STD FLNG.WN B-16.5 ASTM A 105 150 # RF/125AARH , 4.0 INCH SCH STD	20	Numbers
02930	M-FLAN-01502	FLNG.BLIND A 105,IBR ,150, 2.0 INCH FLNG.BLIND B-16.5, IBR , ASTM A 105 150 # RF/125 AARH 2.0 INCH SCH STD	20	Numbers
02940	M-FLAN-01521	SO FLANGE 4.00 SER.FIN/RF/150/STD/A105 SO FLANGE 4.00 SER.FIN/B16.5/RF/150/STD/ASTMA105	120	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
02950	M-FLAN-01522	SW FL.0.75 125AARH/RF/300/S40/A182-F316L SW FLANGE 0.75 125AARH/B16.5/RF/300/S40/ASTMA182Gr F 316L	20	Numbers
02960	M-FLAN-01530	SW FLG/0.50X300#/RF/125AARH/S80/A105/H2 SW FLG/0.50X300#/ANSI B16.5/RF/125AARH/S80/ASTM A105/H2	50	Numbers
02970	M-FLAN-01556	SW FLG/0.50X150#/RF/125AARH/S80/A105/IBR SW FLG/0.50X150#/ANSI B16.5/RF/125AARH/S80/ASTM A105/IBR	100	Numbers
02980	M-FLAN-01557	SW FLG/1.50X150#/RF/125AARH/S80/A105/IBR SW FLG/1.50X150#/ANSI B16.5/RF/125AARH/S80/ASTM A105/IBR	20	Numbers
02990	M-FLAN-01581	WN FLG/3.0X600#/RF/125AARH/S80/A105/IBR WN FLG/3.0X600#/ANSI B16.5/RF/125AARH/S80/ASTM A105/IBR	10	Numbers
03000	M-FLAN-01601	WN FLANGE/8.00/300/RF/S30/ASTM A105/IBR WN FLANGE 8.00/300/B16.5/RF/125AARH/S30/ASTM A105/IBR	5	Numbers
03010	M-FLAN-01604	WN FLANGE 3.00/RF/150/S80/ASTMA105/NACE WN FLANGE 3.00 SER.FIN/B16.5/RF/150/S80/ASTMA105/NACE	25	Numbers
03020	M-FLAN-01617	SW FLANGE/0.50/300/RF/40S/A182GrF316L SW FLANGE/0.50/300/B16.5/RF/125AARH/Sch.40S/ASTM A182GrF316L	40	Numbers
03030	M-FLAN-01620	WN FLANGE/2.00/300/RF/10S/A182GrF316L WN FLANGE/2.00/300/B16.5/RF/125AARH/Sch.10S/ASTM A182GrF316L	5	Numbers
03040	M-FLAN-01626	WN FLANGE 0.75 125AARH/B16.5/RF/150/S160 FLNG.WN, B-16.5, ASTMA 105, 150, RF/125AARH, 0.75 INCH, S160	20	Numbers
03050	M-FLAN-01632	WN FLANGE 4.00/RF/300/XS/ASTMA105/NACE WN FLANGE/4.00/300#/B16.5/RF/125AARH/Sch.XS/ASTM A105/NACE	40	Numbers
03060	M-FLAN-01640	WN FLAN 16.0/B16.5/RF/300/10MM/A105/IBR WN FLANGE/16.0/300#/10MM/B16.5/ RF/125AARH/ASTM A105/IBR	20	Numbers
03070	M-FLAN-01650	BLIND FLANGE/1.0/RF/600/A105/IBR BLIND FLANGE 1.000 125 AARH B-16.5 RF 600 ASTM A105 IBR	20	Numbers
03080	M-FLAN-01656	BLIND FLANGE/1.50/RTJ/1500/ASTMA105/H2 BLIND FLANGE 1.500 B-16.5 RTJ 63AARH 1500 ASTMA105 H2	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
03090	M-FLAN-01680	SW FLANGE/0.50/S160/RF/300/A182 GR. F5 SW FLANGE 0.500 S160 125 AARH B-16.5 RF300 ASTM A182 GR. F5	20	Numbers
03100	M-FLAN-01682	SW FLANGE/1.0/RF/600/XS/A182 GR.F11/IBR SW FLANGE 1.0 125 AARH B-16.5 RF 600 XS ASTM A182 GR.F11 IBR	40	Numbers
03110	M-FLAN-01711	WN FLANGE/2.0/RTJ/1500/S160/A105/H2 WN FLANGE 2.000 B-16.5 RTJ 63AARH 1500 S160 ASTM A 105 H2	20	Numbers
03120	M-FLAN-01742	WN FLNGE 2.0 125AARH/S160/RF/150/A105 WN FLNGE 2.0 125AARH/S160/RF/150/ASTM A105	30	Numbers
03130	M-FLAN-01751	BLIND FLANGE/1.0/RF/600/ASTM A182 GR.F11 BLIND FLANGE 1.000 125 AARH B-16.5 RF 600 ASTM ASTM A182 GR.F11 / IBR	20	Numbers
03140	M-FLAN-01752	28inch#150WN Flan/B16.47-B/ASTMA105/RF 28inch#150WN Flan/B16.47-B/ASTMA105/RF	10	Numbers
03150	M-NPLE-00014	NIPPLE 0.75 80MM LG/EILSTD/TOE/S80/API5L NIPPLE 0.75 80MM LG/EILSTD/TOE/S80/API5LGrB	60	Numbers
03160	M-NPLE-00017	NIPPLE 0.50 80MM LG/EILSTD/TOE/S80/ASTMA NIPPLE 0.50 80MM LG/EILSTD/TOE/S80/ASTMA106GrB	60	Numbers
03170	M-NPLE-00020	NIPPLE 0.50 80MM LG/EILSTD/TOE/S160/API5 NIPPLE 0.50 80MM LG/EILSTD/TOE/S160/API5LGrB	60	Numbers
03180	M-NPLE-00023	NIPPLE,A106,PBE,H2,0.5 INCH,S160,100 M NIPPLE, B-36.10, ASTMA 106 GR.B, PBE, SEAMLESS, H2,0.5 INCH,S160, 100 MM	40	Numbers
03190	M-NPLE-00040	NIPPLE/1.00/100MM/TOE/S160/A106 GR.B/IBR NIPPLE 1.00 100MM LG EIL STD TOE S160 ASTMA 106 GR.B IBR	50	Numbers
03200	M-NPLE-00046	NIPPLE 1.00/80MM/LG/3000/TOE/S80/API5LGr NIPPLE 1.00/80MM/LG/3000/TOE/S80/API5LGrB/B16.11	60	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
03210	M-NPLE-00189	NIPPLE A 106 H2 0.75 IN S160 100 MM NIPPLE B-36.10 ASTM A 106 GR.B PBE SEAMLESS H2 0.75 INCH S160 100 MM PN21967Z705100100	40	Numbers
03220	M-NPLE-00229	NIPPLE 0.75 80MM TOE S160 A106 GR.B H2 NIPPLE 0.750 80MM LG EIL STD TOE S160 ASTM A106 GR.B H2	40	Numbers
03230	M-NPLE-00251	NIPPLE/1.00/100MM/TOE/ASTM A182 GR.F11 NIPPLE/1.00/100MM/3000/TOE/ASTM A182 GR.F11/IBR	20	Numbers
03240	M-REDU-00002	REDUC.ECC, GR.WPB, H2, 3.0, STD, 2.0, X REDUC.ECC, B-16.9, ASTM A 234 GR.WPB, BW, H2, 3.0 INCH, STD, 2.0 INCH, XS	20	Numbers
03250	M-REDU-00007	CON.REDUCR 0.75X0.50 B16.11/SW/3000/ASTM CON.REDUCR 0.75X0.50 B16.11/SW/3000/ASTMA105	130	Numbers
03260	M-REDU-00010	CON.REDUCR 1.50X1.00 B16.11/SW/3000/ASTM CON.REDUCR 1.50X1.00 B16.11/SW/3000/ASTMA105	50	Numbers
03270	M-REDU-00017	CON.REDUCR 3.00X2.00 B16.9/BW/S40/S40/AS CON.REDUCR 3.00X2.00 B16.9/BW/S40/S40/ASTMA234GrWPB	24	Numbers
03280	M-REDU-00017	CON.REDUCR 3.00X2.00 B16.9/BW/S40/S40/AS CON.REDUCR 3.00X2.00 B16.9/BW/S40/S40/ASTMA234GrWPB	20	Numbers
03290	M-REDU-00045	CON.REDUCR 4.00X3.00 B16.9/BW/STD/STD/AS CON.REDUCR 4.00X3.00 B16.9/BW/STD/STD/ASTMA234GrWPB	5	Numbers
03300	M-REDU-00120	ECC.REDUCR 2.0 X 3.0/BW/10S/10S/316L/AST ECC.REDUCR 2.0 X 3.0/BW/10S/10S/316L/ASTMA403WP316L/ B16.9	20	Numbers
03310	M-REDU-00373	ECC.REDUCR 4.00X3.00 B16.9/BW/STD/STD/AS ECC.REDUCR 4.00X3.00 B16.9/BW/STD/STD/ASTMA234GrWPB	40	Numbers
03320	M-REDU-00375	ECC.REDUCR 6.00X4.00 B16.9/BW/STD/STD/AS ECC.REDUCR 6.00X4.00 B16.9/BW/STD/STD/ASTMA234GrWPB	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
03330	M-REDU-00666	CON.REDUCR 3.00X1.50 B16.9/PBE/STD/XS/AS CON.REDUCR 3.00X1.50 B16.9/PBE/STD/XS/ASTMA106GrB/IBR	20	Numbers
03340	M-REDU-00835	8x6,RED CONC,IS-3589 GR330,6.35,HVY,STD 8 " x 6 " , REDUCER, CONCENTRIC , A3A , BW , IS-3589 GR.330, SCH.6.35, SCH.HVY, EIL' STD	5	Numbers
03350	M-REDU-01170	ECC.REDUCR 3X2/BW/STD/STD/A234GrWPB ECC.REDUCR 3.00X2.00 B16.9/BW/STD/STD/ASTMA234GrWPB	24	Numbers
03360	M-REDU-01174	CON.REDU. 4.0X3.0/BW/XS/XS/A234 GR.WPB CON.REDUCER 4.00X3.00/B16.9/BW/XS/XS/ASTM A234 GR.WPB/NACE	15	Numbers
03370	M-REDU-01208	CON REDU 2.0 X 1.5 STD XS A234 GR.WPB CON REDUCER 2.000X 1.500 B-16.9 BW STD XS ASTM A234 GR.WPB	30	Numbers
03380	M-REDU-01233	ECC. REDU 2.0 X 1.5 STD XS A234 GR.WPB ECC. REDUCER 2.000X 1.500 B-16.9 BW STD XS ASTM A234 GR.WPB	20	Numbers
03390	M-SPBL-00049	SPCR & BLN/10.0/150/ASTM A105 API-590 FF SPCR & BLN/10.0/150/ASTM A105 API-590 FF	2	Numbers
03400	M-SWAG-00003	SWAGE.CONC A 105 PBE 0.75 IN XS 0.5 IN SWAGE.CONC BS-3799 ASTM A 105 PBE 0.75 INCH XS 0.5 INCH XS WNH026ZZ005190419	200	Numbers
03410	M-SWAG-00099	SWAGE.CONC, F316L, 0.75 80S,0.5 80S SWAGE.CONC, BS-3799, ASTM A 182 GR.F316L, PBE, 0.75 INCH, 80S,0.5 INCH, 80S	20	Numbers
03420	M-SWAG-00103	SWAGE.CONC, A105, AXN2, 0.75 S160, 0.5 SWAGE.CONC, BS-3799, ASTM A 105, PBE, AXN2, 0.75 INCH, S160, 0.5 INCH, S160	88	Numbers
03430	M-SWAG-00130	SWAGE.CONC,A105, 0.75 S160, 0.5 S160 SWAGE.CONC, BS-3799, ASTM A 105, PBE, 0.75 INCH, S160, 0.5 INCH, S160	96	Numbers
03440	M-SWAG-00133	SWAGE.CONC,A105, PBE, 1.0 XS, 0.75 S160 SWAGE.CONC, BS-3799, ASTM A 105, PBE, 1.0 INCH, XS, 0.75 INCH,S160	20	Numbers
03450	M-SWAG-00136	SWAGE.CONC, A105, PBE, 1.5 XS, 0.75 XS	88	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		SWAGE.CONC, BS-3799, ASTM A 105, PBE, 1.5 INCH, XS, 0.75 INCH,XS		
03460	M-SWAG-00138	SWAGE.CONC/0.5X0.75/3000/SW/A 105/IBR/B1 SWAGE.CONC/0.5X0.75/3000/SW/A 105/IBR/B16.11	20	Numbers
03470	M-SWGE-00001	CON.SWGE 1.50X0.75/PBE/S160/S160/A106GrB CON.SWGE 1.50X0.750 EILSTD/PBE/S160/S160/A106 Gr. B	42	Numbers
03480	M-SWGE-00005	CON. SWAGE 1.50 x 0.75/S80S/A403TP304L CON. SWAGE 1.50 x 0.75 S80S X S80S A403 TP304L	20	Numbers
03490	M-SWGE-00006	SWAGE.CONC NACE/3/4"x1 1/2"/S160/ASTM SWAGE.CONC NACE/3/4"x1 1/2"/S160/ASTM A 105/PBE/BS-3799	20	Numbers
03500	M-SWGE-00007	SWAGE.CONC LTCS/3/4"x1/2"/S160/ASTM A SWAGE.CONC LTCS/3/4"x1/2"/S160/ASTM A 182 GR.F5/PBE/BS-3799	20	Numbers
03510	M-SWGE-00008	SWAGE.CONC LTCS/3/4"x1 1/2"/S160/ASTM SWAGE.CONC LTCS/3/4"x1 1/2"/S160/ASTM A 182 GR.F5/PBE/BS-3799	20	Numbers
03520	M-SWGE-00009	SWAGE.CONC H2 Service/3/4"x1/2"/S80/X SWAGE.CONC H2 Service/3/4"x1/2"/S80/XS/ASTM A 105/PBE/BS-3799	24	Numbers
03530	M-SWGE-00010	SWAGE.CONC H2 Service/3/4"x1 1/2"/S80 SWAGE.CONC H2 Service/3/4"x1 1/2"/S80/XS/ASTM A 105/PBE/BS-3799	20	Numbers
03540	M-SWGE-00011	SWAGE.CONC (NACE + H2)/3/4"x1 1/2"/S1 SWAGE.CONC (NACE + H2)/3/4"x1 1/2"/S160/ASTM A 105/PBE/BS-3799	20	Numbers
03550	M-SWGE-00012	SWAGE.CONC NACE/3/4"x1/2"/XXS/ASTM A SWAGE.CONC NACE/3/4"x1/2"/XXS/ASTM A 105/PBE/BS-3799	20	Numbers
03560	M-SWGE-00013	SWAGE.CONC NACE/3/4"x1 1/2"/XXS/ASTM SWAGE.CONC NACE/3/4"x1 1/2"/XXS/ASTM A 105/PBE/BS-3799	20	Numbers
03570	M-SWGE-00014	SWAGE.CONC NACE/3/4"x1/2"/XXS/ASTM 23 SWAGE.CONC NACE/3/4"x1/2"/XXS/ASTM 234 GR. WPB/BW/BS-3799	20	Numbers
03580	M-SWGE-00015	SWAGE.CONC NACE/3/4"x1 1/2"/XXS/ASTM SWAGE.CONC NACE/3/4"x1 1/2"/XXS/ASTM 234 GR. WPB/BW/BS-3799	20	Numbers
03590	M-SWGE-00016	SWAGE.CONC IBR/3/4"x1 1/2"/XS/S80/AST SWAGE.CONC IBR/3/4"x1 1/2"/XS/S80/ASTM A 105/PBE/BS-3799	20	Numbers
03600	M-SWGE-00017	SWAGE.CONC/3/4"x1/2"/XS/S80/A182 GR. SWAGE.CONC/3/4"x1/2"/XS/S80/A182 GR. F304L/PBE/BS-3799	20	Numbers
03610	M-SWGE-00018	SWAGE.CONC LTCS/3/4"x1/2"/S160/F11/AS	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		SWAGE.CONC LTCS/3/4"x1/2"/S160/F11/ASTM A 182 GR.F11/PBE/B - 16.11		
03620	M-SWGE-00019	SWAGE.CONC LTCS/3/4"x1 1/2"/S160/F11/ SWAGE.CONC LTCS/3/4"x1 1/2"/S160/F11/ASTM A 182 GR.F11/PBE/B - 16.11	20	Numbers
03630	M-SWGE-00022	CON.SWGE/0.5X1.0/IBR/3000/SW/A 105/B16.1 CON.SWGE/0.5X1.0/IBR/3000/SW/A 105/B16.11	20	Numbers
03640	M-SWGE-00023	ECC.SWGE/0.5X1.0/3000/SW/A 105/IBR/B16.1 ECC.SWGE/0.5X1.0/3000/SW/A 105/IBR/B16.11	20	Numbers
03650	M-SWGE-00024	CONC.SWGE/0.75X0.50/6000/PBE/F5/BS-3799/ CONC.SWGE/0.75X0.50/6000/PBE/F5/BS-3799/ASTMA182GrF5	20	Numbers
03660	M-SWGE-00025	CON.SWGE 1.50X0.75/6000/PBE/F5/BS-3799/A CON.SWGE 1.50X0.75/6000/PBE/F5/BS-3799/ASTMA182GrF5	20	Numbers
03670	M-SWGE-00026	ECC.SWGE/3.0X1.5/PBE/STD/3000/A105/BS-37 ECC.SWGE/3.0X1.5/PBE/STD/3000/A105/BS-3799/ASTMA105	20	Numbers
03680	M-SWGE-00064	CON.SWGE 0.75X0.50 EILSTD/PBE/XS/XS/API5 CON.SWGE 0.75X0.50 EILSTD/PBE/XS/XS/API5LGrB *(EIL STD. 7-44-027).	20	Numbers
03690	M-SWGE-00066	CON.SWGE 1.00X0.75 EILSTD/PBE/XS/XS/API5 CON.SWGE 1.00X0.75 EILSTD/PBE/XS/XS/API5LGrB *(EIL STD. 7-44-027).	10	Numbers
03700	M-SWGE-00076	CON.SWGE 1.50X1.00 EILSTD/PBE/XS/XS/API5 CON.SWGE 1.50X1.00 EILSTD/PBE/XS/XS/API5LGrB *(EIL STD. 7-44-027).	20	Numbers
03710	M-SWGE-00262	CON.SWGE 2X1 BS-3799/PBE/STD/XS/A 105 CON.SWAGE 2.00X1.00 BS-3799/PBE/STD/XS/ASTM A 105	30	Numbers
03720	M-SWGE-00268	CON. SWAGE 0.75x0.50 S40 S40 A403 TP316L CON. SWAGE 0.750 x 0.50 EIL STD PBE S40 S40 ASTM A403 TP316L	20	Numbers
03730	M-SWGE-00280	CON. SWAGE1.0x0.75 S160 S160 A106 GRB H2 CON. SWAGE 1.000x 0.750 EIL STD S160 S160 ASTM A106 GR.B H2	50	Numbers
03740	M-SWGE-00282	CON. SWAGE 1.5x0.75 S40 S40 A403 TP316L CON. SWAGE 1.50 x 0.750 EIL STD PBE S40 S40 ASTM A403 TP316L	20	Numbers
03750	M-TEES-00001	EQ.TEE 0.50 B16.11/SW/3000/ASTMA105 .	370	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		EQ.TEE 0.50 B16.11/SW/3000/ASTMA105.		
03760	M-TEES-00003	EQ.TEE 0.75 B16.11/SW/3000/ASTMA105 . EQ.TEE 0.75 B16.11/SW/3000/ASTMA105.	400	Numbers
03770	M-TEES-00004	EQ.TEE 0.75 B16.11/SW/6000/ASTMA105 . EQ.TEE 0.75 B16.11/SW/6000/ASTMA105.	150	Numbers
03780	M-TEES-00005	EQ.TEE 1.00 B16.11/SW/3000/ASTMA105 . EQ.TEE 1.00 B16.11/SW/3000/ASTMA105.	200	Numbers
03790	M-TEES-00006	EQ.TEE 1.00 B16.11/SW/6000/ASTMA105 . EQ.TEE 1.00 B16.11/SW/6000/ASTMA105.	50	Numbers
03800	M-TEES-00007	EQ.TEE 1.50 B16.11/SW/3000/ASTMA105 . EQ.TEE 1.50 B16.11/SW/3000/ASTMA105.	190	Numbers
03810	M-TEES-00008	EQ.TEE 1.50 B16.11/SW/6000/ASTMA105 . EQ.TEE 1.50 B16.11/SW/6000/ASTMA105.	100	Numbers
03820	M-TEES-00020	EQ.TEE 2.00 B16.9/BW/S160/ASTMA234GrWPB EQ.TEE 2.00 B16.9/BW/S160/ASTMA234GrWPB.	15	Numbers
03830	M-TEES-00042	EQ.TEE 4.00 B16.9/BW/STD/ASTMA234GrWPB . EQ.TEE 4.00 B16.9/BW/STD/ASTMA234GrWPB.	60	Numbers
03840	M-TEES-00044	EQ.TEE 6.00 B16.9/BW/STD/ASTMA234GrWPB . EQ.TEE 6.00 B16.9/BW/STD/ASTMA234GrWPB.	15	Numbers
03850	M-TEES-00048	EQ.TEE 3.00 B16.9/BW/STD/ASTMA234GrWPB . EQ.TEE 3.00 B16.9/BW/STD/ASTMA234GrWPB.	80	Numbers
03860	M-TEES-00056	EQ.TEE 1.50 B16.11/SW/3000/ASTMA105/IBR EQ.TEE 1.50 B16.11/SW/3000/ASTMA105/IBR.	50	Numbers
03870	M-TEES-00063	EQ.TEE 2.00 B16.9/BW/STD/ASTMA234GrWPB/ EQ.TEE 2.00 B16.9/BW/STD/ASTMA234GrWPB/IBR	40	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
03880	M-TEES-00066	EQ.TEE 6.00 B16.9/BW/STD/ASTMA234GrWPB/ EQ.TEE 6.00 B16.9/BW/STD/ASTMA234GrWPB/IBR	5	Numbers
03890	M-TEES-00072	T.EQUAL,F316L, SW, 3000, 0.5INCH T.EQUAL, B-16.11, ASTM A 182 GR.F316L, SW, 3000, 0.5INCH	20	Numbers
03900	M-TEES-00075	T.EQUAL,WPB, BW, 2.0 INCH, XS T.EQUAL, B-16.9, ASTM 234 GR.WPB, BW, 2.0 INCH, XS	20	Numbers
03910	M-TEES-00081	T.EQUAL, A105, SW, 6000, AXN1, 0.5 INCH T.EQUAL, B-16.11, ASTM A 105, SW, 6000, AXN1, 0.5 INCH	60	Numbers
03920	M-TEES-00082	T.EQUAL,A105, SW, 6000, AXN1, 0.75 INCH T.EQUAL, B-16.11, ASTM A 105, SW, 6000, AXN1, 0.75 INCH	60	Numbers
03930	M-TEES-00090	T.EQUAL, A105, SW, 3000, H2, 1.5 INCH T.EQUAL, B-16.11, ASTM A 105, SW, 3000, H2, 1.5 INCH	20	Numbers
03940	M-TEES-00092	EQ.TEE 2.00 B16.9/BW/STD/ASTMA234/GrWPB EQ.TEE 2.00 B16.9/BW/STD/ASTMA234/GrWPB.	200	Numbers
03950	M-TEES-00094	EQ.TEE 3.0/XS/BW/A234 GR. WPB/NACE EQ.TEE 3.0/B 16.9/BW/XS/ASTM A 234 GR. WPB/NACE	30	Numbers
03960	M-TEES-00108	EQ. TEE 0.500 B16.11 SW 6000 ASTM A105 EQ. TEE 0.500 B-16.11 SW 6000 ASTM A105	250	Numbers
03970	M-TEES-00109	EQ. TEE 0.750 /SW/3000/ASTM A105/H2 EQ. TEE 0.750 B-16.11 SW 3000 ASTM A105 / H2	30	Numbers
03980	M-TEES-00119	Eq Tee NACE/1.5"/6000#/ASTM A 105/SW/B Eq Tee NACE/1.5"/6000#/ASTM A 105/SW/B -16.11	20	Numbers
03990	M-TEES-00120	Eq Tee LTCS/1/2"/6000#/ASTM A 182 GR.F Eq Tee LTCS/1/2"/6000#/ASTM A 182 GR.F5/SW/B -16.11	20	Numbers
04000	M-TEES-00121	Eq Tee LTCS/3/4"/6000#/ASTM A 182 GR.F Eq Tee LTCS/3/4"/6000#/ASTM A 182 GR.F5/SW/B -16.11	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
04010	M-TEES-00122	Eq Tee LTCS/1.5"/6000#/ASTM A 182 GR.F Eq Tee LTCS/1.5"/6000#/ASTM A 182 GR.F5/SW/B -16.11	20	Numbers
04020	M-TEES-00123	Eq Tee NACE +H2/1/2"/6000#/ASTM A 105/ Eq Tee NACE +H2/1/2"/6000#/ASTM A 105/SW/B -16.11	20	Numbers
04030	M-TEES-00124	Eq Tee NACE +H2/3/4"/6000#/ASTM A 105/ Eq Tee NACE +H2/3/4"/6000#/ASTM A 105/SW/B -16.11	20	Numbers
04040	M-TEES-00125	Eq Tee NACE +H2/1.5"/6000#/ASTM A 105/ Eq Tee NACE +H2/1.5"/6000#/ASTM A 105/SW/B -16.11	20	Numbers
04050	M-TEES-00126	Eq Tee NACE/1/2"/9000#/ASTM A 105/SW/B Eq Tee NACE/1/2"/9000#/ASTM A 105/SW/B -16.11	20	Numbers
04060	M-TEES-00127	Eq Tee NACE/3/4"/9000#/ASTM A 105/SW/B Eq Tee NACE/3/4"/9000#/ASTM A 105/SW/B -16.11	20	Numbers
04070	M-TEES-00128	Eq Tee NACE/1.5"/9000#/ASTM A 105/SW/B Eq Tee NACE/1.5"/9000#/ASTM A 105/SW/B -16.11	20	Numbers
04080	M-TEES-00129	Eq Tee H2 Service/1/2"/XXS/ASTM 234 GR Eq Tee H2 Service/1/2"/XXS/ASTM 234 GR. WPB/BW/B -16.9	20	Numbers
04090	M-TEES-00130	Eq Tee H2 Service/3/4"/XXS/ASTM 234 GR Eq Tee H2 Service/3/4"/XXS/ASTM 234 GR. WPB/BW/B -16.9	20	Numbers
04100	M-TEES-00131	Eq Tee H2 Service/1.5"/XXS/ASTM 234 GR Eq Tee H2 Service/1.5"/XXS/ASTM 234 GR. WPB/BW/B -16.9	20	Numbers
04110	M-TEES-00132	Eq Tee/1/2"/3000#/A182 GR. F304L/SW/B Eq Tee/1/2"/3000#/A182 GR. F304L/SW/B -16.11	20	Numbers
04120	M-TEES-00133	Eq Tee/3/4"/3000#/A182 GR. F304L/SW/B Eq Tee/3/4"/3000#/A182 GR. F304L/SW/B -16.11	20	Numbers
04130	M-TEES-00134	Eq Tee/1.5"/3000#/A182 GR. F304L/SW/B Eq Tee/1.5"/3000#/A182 GR. F304L/SW/B -16.11	20	Numbers
04140	M-TEES-00135	Eq Tee/1.5"/3000#/ASTM A 182 GR.F316L/ Eq Tee/1.5"/3000#/ASTM A 182 GR.F316L/SW/B -16.11	20	Numbers
04150	M-TEES-00136	Eq Tee LTCS/1/2"/6000#/F11/ASTM A 182 Eq Tee LTCS/1/2"/6000#/F11/ASTM A 182 GR.F11/SW/B -16.11	20	Numbers
04160	M-TEES-00137	Eq Tee LTCS/3/4"/6000#/F11/ASTM A 182 Eq Tee LTCS/3/4"/6000#/F11/ASTM A 182 GR.F11/SW/B -16.11	20	Numbers
04170	M-TEES-00138	Eq Tee LTCS/1.5"/6000#/F11/ASTM A 182	20	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
		Eq Tee LTCS/1.5"/6000#/F11/ASTM A 182 GR.F11/SW/B -16.11		
04180	M-TEES-00139	Eq Tee NACE/1/2"/XXS/ASTM 234 GR. WPB/ Eq Tee NACE/1/2"/XXS/ASTM 234 GR. WPB/BW/B -16.11	20	Numbers
04190	M-TEES-00140	Eq Tee NACE/3/4"/XXS/ASTM 234 GR. WPB/ Eq Tee NACE/3/4"/XXS/ASTM 234 GR. WPB/BW/B -16.11	20	Numbers
04200	M-TEES-00141	Eq Tee NACE/1.5"/XXS/ASTM 234 GR. WPB/ Eq Tee NACE/1.5"/XXS/ASTM 234 GR. WPB/BW/B -16.11	20	Numbers
04210	M-TEES-00142	EQ.TEE/2.0/B16.9/BW/S160/A234GrWPB/H2/AS EQ.TEE/2.0/B16.9/BW/S160/A234GrWPB/H2/ASTMA234GrWPB	20	Numbers
04220	M-TEES-00143	EQ.TEE/12.0/B16.9/BW/S140/A234GrWPB/H2/A EQ.TEE/12.0/B16.9/BW/S140/A234GrWPB/H2/ASTMA234GrWPB	2	Numbers
04230	M-TEES-00144	EQ. TEE 3.0/BW/10S/A403GR.WP316L EQ. TEE 3.0/BW/10S/A403GR.WP316L	20	Numbers
04240	M-TEES-00233	EQ.TEE 0.50 B16.11/SW/3000/ASTMA182GrF 3 EQ.TEE 0.50 B16.11/SW/3000/ASTMA182GrF304	15	Numbers
04250	M-TEES-004673	EQ.TEE,0.75",B16.11,SW,3000,ASTMA105,IBR EQ.TEE,0.75",B16.11,SW,3000,ASTM A 105,IBR.	50	Numbers
04260	M-TEES-00560	EQ. TEE 0.50 B16.11/SW/3000/ASTMA105/IBR EQ. TEE 0.50 B16.11/SW/3000/ASTMA105/IBR	60	Numbers
04270	M-TEES-00561	EQ. TEE 1.00 B16.11/SW/3000/ASTMA105/IBR EQ. TEE 1.00 B16.11/SW/3000/ASTMA105/IBR	70	Numbers
04280	M-TEES-00575	EQ.TEE 0.50 B16.11/SW/XS/ASTM A182 GrF5 EQ.TEE 0.50 B16.11/SW/XS/ASTM A182 GrF5	40	Numbers
04290	M-TEES-00577	EQ.TEE 1.50 B16.11/SW/XS/ASTM A182 GrF5 EQ.TEE 1.50 B16.11/SW/XS/ASTM A182 GrF5	40	Numbers
04300	M-TEES-00580	EQ.TEE 0.75 B16.11/SW/40S/ASTMA182F316L EQ.TEE 0.75 B16.11/SW/40S/ASTM A182 F316L	40	Numbers
04310	M-TEES-00581	EQ.TEE 1.50 B16.11/SW/40S/ASTM A182F304 EQ.TEE 1.50 B16.11/SW/40S/ASTM A182 F304	40	Numbers
04320	M-TEES-00607	EQ. TEE/0.50/B16.11/SW/3000/A105 / H2 EQ. TEE 0.500 B-16.11 SW 3000 ASTM A105 / H2	25	Numbers

RFQ number : 6100029174

Item	Material Code	Description	Order Qty	UoM
04330	M-TEES-00612	EQ. TEE/0.75/B16.11/SW/6000/A182 GR.F5 EQ. TEE 0.750 B-16.11 SW 6000 A182 GR.F5	30	Numbers
04340	M-TEES-00628	1.5"X1.5"X0.5" Red. Tee,A105, 3000# 1.5"X1.5"X0.5" Red. Tee,A105, 3000#, Threaded	192	Numbers
04350	M-TEES-00630	EQ. TEE 1.00 B16.11/SW/3000/ASTM A182 GR EQ. TEE 1.00 B16.11/SW/3000/ASTM A182 GR.F11/IBR	20	Numbers
04360	M-TEES-00631	RED. TEE 1.5"x1" B16.11/SW/3000/ASTM RED. TEE 1.5"x1" B16.11/SW/3000/ASTM A182 GR.F11/IBR	20	Numbers
04370	M-UNON-00006	UNION/0.75/B-16.11/SCRF/3000/ASTM A105 UNION/0.75/B-16.11/SCRF/3000/ASTM A105	60	Numbers
04380	M-UNON-00064	UNION 0.500 B-16.11 SCRF3000 ASTM A 105 UNION 0.500 B-16.11 SCRF3000 ASTM A 105	84	Numbers
04390	M-CAPS-00003	CAP 1.00 B16.11/SCRD3000/ASTMA105 . CAP 1.00 B16.11/SCRD3000/ASTMA105.	60	Numbers

Annexure II : Checklist for Submission of Offer for Flanges & Pipe fitting.

Sl.No.	Purchase order (PO) Number	PO date	PO received from (Name of the Industry/Purchaser)	Delivery date as per PO	Actual delivery date	Metallurgy details of fittings in the mentioned PO (such as ASTM A 105 / A106 Gr.B, A A234 GR. WPB/WPC, A234 GR.WP5/P9/P11/A182/A403 GR 304/316/Wet H2S service (AXN type) etc.)	PO value (Rs.)	Delivery proof against mentioned PO provided (Yes/No)

Bidder to take utmost care while filling the above-mentioned details. If any mismatch found during technical evaluation, the offer/bid will be straightway rejected. In absence of this excel sheet the offer/bid shall not be considered for evaluation.

NUMALIGARH REFINERY LIMITED		Technical Specification For Procurement of Pipe Fittings and Flanges	Doc. No.: MM/Tech./04/2010
			Rev.: 00
			Page 1 of 6

TECHNICAL SPECIFICATION

FOR

PIPE FITTINGS AND FLANGES

<u>Prepared by:</u> R Saikia, Dy. Manager (MM) M K Borah, Manager (Maint.)	<u>Reviewed by:</u> G N Sarmah Chief Manager (Mech. Maint.)	<u>Approved by:</u> S Chakraborty Dy. General Manager (Maint.)
--	---	--

NUMALIGARH REFINERY LIMITED		Technical Specification For Procurement of Pipe Fittings and Flanges	Doc. No.: MM/Tech./04/2010
			Rev.: 00
			Page 2 of 6

CONTENTS

- 1.0 SCOPE
- 2.0 REFERENCE DOCUMENTS
- 3.0 GENERAL REQUIREMENTS
- 4.0 INSPECTION REQUIREMENTS
- 5.0 SCOPE OF INSPECTION OF THIRD PARTY
- 6.0 MARKING AND DESPATCH
- 7.0 DOCUMENTATION

=====

1.0 SCOPE

This specification covers the specific requirements for manufacture, inspection, testing and supply of Pipe fittings and flanges of different metallurgy as per the purchase requisition.

2.0 REFERENCE DOCUMENTS

The following specifications shall be followed for manufacturing and testing the pipe fittings and flanges. Wherever a specification is mentioned it shall be the latest edition.

- ASME B 31.3
- IS-1239
- IS-3589
- ANSI B36.10
- ANSI B36.19
- ANSI B16.25
- ANSI B16.11
- ANSI B16.5
- All other relevant ASME, ASTM and ANSI standards
- API 5L
- NACE materials as per MR-01-75
- IBR

3.0 GENERAL REQUIREMENTS

- 3.1 Chemical composition, Physical properties, tests, Dimensions and tolerances, heat treatment and marking shall conform to the applicable codes / standards / specifications as specified in the requisition.

<u>Prepared by:</u> R Saikia, Dy. Manager (MM) M K Borah, Manager (Maint.)	<u>Reviewed by:</u> G N Sarmah Chief Manager (Mech. Maint.)	<u>Approved by:</u> S Chakraborty Dy. General Manager (Maint.)
--	---	--

NUMALIGARH REFINERY LIMITED		Technical Specification For Procurement of Pipe Fittings and Flanges	Doc. No.: MM/Tech./04/2010
			Rev.: 00
			Page 3 of 6

- 3.2 Test reports shall be supplied for all mandatory and supplementary tests as per the material specification.
- 3.3 All fittings shall be seamless in construction unless otherwise specified. Butt welded fittings shall not be acceptable in place of seamless.
- 3.4 Outside diameters and wall thickness (unless otherwise mentioned) of Butt weld fittings shall be in accordance with ANSI B36.10 and ANSI B36.19 as applicable.
- 3.5 For reducing Butt weld fittings having different wall thicknesses at each end, the greater wall thickness of the fittings shall be employed and inside bore at each end shall be matched with the specified inside diameter.
- 3.6 Bevelled ends for all fittings and flanges shall conform to ANSI B16.25.
- 3.7 The bevel ends of all Butt welded fittings shall undergo 100 % Magnetic Particle / Dye Penetrant test.
- 3.8 Thickness / schedule lower or higher than specified shall not be accepted.
- 3.9 All pipes employed for manufacturing fittings shall be required to have undergone hydrotest as per ASTM A530.
- 3.10 All socket weld and screwed fittings shall be in accordance with ANSI B16.11

3.11 Special Requirements for Hydrogen Service

These are additional requirements, applicable for the material in addition to the requirements specified in the relevant applicable codes/specs.

- 3.11.1 All carbon steel fittings having wall thickness 9.53 mm and above shall be normalized. Cold drawn fittings shall be normalized after the final cold draw pass for all the thicknesses. In addition, fittings made from forgings shall have Carbon- 0.35% max and Si –0.35 % max. The normalizing heat treatment shall be a separate heating operation and not a part of the hot forming operation.
- 3.11.2 Impact test: Fittings with thickness over 19 mm, Charpy V-notch impact testing shall be carried out in accordance with para UG –84 of ASME section VIII Div I for base metal from the thickest item per heat of material and per heat treating batch. Impact test specimen shall be in complete heat treated condition and in accordance with ASTM A 370. Impact energies at 0 deg C shall average greater than 27J per set of 3 specimens, with a min. of 19 J.
- 3.12 The gasket contact surface roughness for class 150 to 600 raised face flanges and spades, etc. shall be between 6.3 and 3.2 micrometers Ra (250 - 125 AARH), in accordance with ASME B46.1. Similarly for RTJ flanges the finish shall be 63 AARH.

3.13 NACE Requirements

Pipe fittings and flanges under NACE shall meet the requirement of NACE- MR-01-75 (latest edition)

<u>Prepared by:</u> R Saikia, Dy. Manager (MM) M K Borah, Manager (Maint.)	<u>Reviewed by:</u> G N Sarmah Chief Manager (Mech. Maint.)	<u>Approved by:</u> S Chakraborty Dy. General Manager (Maint.)
--	---	--

NUMALIGARH REFINERY LIMITED		Technical Specification For Procurement of Pipe Fittings and Flanges	Doc. No.: MM/Tech./04/2010
			Rev.: 00
			Page 4 of 6

All NACE material shall have Carbon equivalent less than 0.40. Carbon equivalent shall be computed as below:

$$CE = C + Mn /6 + (Cr + Mo + V) /5 + (Ni + Cu) /15$$

3.14 IBR Requirements

3.14.1 IBR fittings and flanges shall be accompanied with "Original" IBR certificate in Form III-C duly approved and signed by IBR authority / local authority empowered by Central Boiler Board of India.

3.14.2 For Carbon steel items under IBR the chemical composition shall conform the following.

Carbon (Max): 0.25 %

Others (S, P, Mn): as prescribed under IBR regulation

4.0 INSPECTION REQUIREMENTS

4.1 All fittings shall be made from seamless pipes unless otherwise specified in Purchase Order.

4.2 Steel die marking shall not be permitted on body of butt weld fittings.

4.3 All raw materials shall be verified with certificate for chemical and physical properties, hydrotest requirement (as stipulated in technical spec) issued by the manufacturer's quality control section and will be endorsed by Third Party Inspector as identification of material.

4.4 All fittings and flanges shall be supplied in heat treated condition as per ASTM Standard mentioned.

4.5 Visual inspection and dimensional checking of 100% fittings and flanges as per relevant ANSI, ASTM Standards, shall be carried out by Third Party Inspection.

[This includes Thickness checking of 100% fittings]

4.6 Manufacturer shall provide the following reports as per relevant standards mentioned in the technical specifications / Purchase Order. All reports to be endorsed by third party inspection agency.

- Chemical analysis reports
- Tensile results
- Heat Treatment records
- Hardness Test Results
- Impact Test reports, radiography report, IGC test report , hydrotest (if required in the specified Standard)

<u>Prepared by:</u> R Saikia, Dy. Manager (MM) M K Borah, Manager (Maint.)	<u>Reviewed by:</u> G N Sarmah Chief Manager (Mech. Maint.)	<u>Approved by:</u> S Chakraborty Dy. General Manager (Maint.)
--	---	--

NUMALIGARH REFINERY LIMITED		Technical Specification For Procurement of Pipe Fittings and Flanges	Doc. No.: MM/Tech./04/2010
			Rev.: 00
			Page 5 of 6

4.7 All items shall be stamped as per relevant ASTM / ANSI / API Standard.

5.0 SCOPE OF INSPECTION FOR THIRD PARTY

This scope of inspection shall be read with item description, codes stipulated in purchase requisition, requirement of test and inspection as per this technical specification. The items during manufacture shall be subjected to inspection by Third Party Inspection Agency (TPI). The vendor shall develop their Quality Assurance plan (QAP) which shall essentially contain characteristics of test/check, quantum and type of check, reference documents for acceptance criteria and scope of inspection by vendor or owner / TPI and submit to NRL for review / acceptance. The scope of inspection shall include (but not limited to) the following:

5.1 Tests to be witnessed:

- Testing for physical properties
- Visual inspection: 100%
- Dimensional check: 100%
- Thickness check: 100%

5.2 Review of documents :

- Mill T.C of raw materials
- Positive Materials identification reports
- Radiographs
- Heat Treatment Charts
- Manufacturers test certificates

5.3 Third party inspection shall issue a release note on their letterhead giving correlation-marking details. The Third party inspection shall contain the information on tests witnessed, documents reviewed, observations/remarks, identifications, order status and date(s) of inspection. All the documents along with original certificate and release note shall be furnished with supplies.

6.0 MARKING AND DESPATCH

6.1 Each fitting and flange shall be legibly and conspicuously marked in accordance with the requirements of applicable API / ANSI standards.

<u>Prepared by:</u> R Saikia, Dy. Manager (MM) M K Borah, Manager (Maint.)	<u>Reviewed by:</u> G N Sarmah Chief Manager (Mech. Maint.)	<u>Approved by:</u> S Chakraborty Dy. General Manager (Maint.)
--	---	--

NUMALIGARH REFINERY LIMITED		Technical Specification For Procurement of Pipe Fittings and Flanges	Doc. No.: MM/Tech./04/2010
			Rev.: 00
			Page 6 of 6

- 6.2 Paint or ink for marking shall not contain any harmful metal or metal salts such as Zinc, Lead, and Copper which cause corrosive attack on heating.
- 6.3 All items shall be dry, clean and free of moisture, dirt and loose foreign materials of any kind.
- 6.4 All items shall be protected from rust, corrosion and mechanical damage during transportation, shipment and storage.
- 6.5 Rust preventive used on machined surfaces to be welded shall be easily removable with a petroleum solvent or the same shall not be harmful to welding.
- 6.6 Each end of fitting shall be protected with a wood, metal or plastic cover. Similarly, Critical faces of flanges like serrations shall be suitably protected.
- 6.7 Each size of fitting shall be supplied in separate packaging marked with the Purchase Order no., material specification, size, and schedule/thickness/rating. **Also each item shall bear NRL item code no.**

7.0 DOCUMENTATION

The supplier shall submit the following records of the test and inspection conducted on the materials, to the Company in quadruplicate:

1. Result of the tests (Physical and Chemical) carried out duly endorsed by third party inspection agency
2. Heat treatment records
3. Radiography records wherever applicable
4. Third party Inspection release note / IBR Certificate in original clearly indicating the NRL purchase order no. and item code.
5. For IBR pipes, in case the bidder belongs to "Well Known Maker" category of IBR, then copy of validation shall be submitted along with supply. However, for sub vendors / traders, IBR inspection is mandatory even if the product is sourced from a well known maker.

<u>Prepared by:</u> R Saikia, Dy. Manager (MM) M K Borah, Manager (Maint.)	<u>Reviewed by:</u> G N Sarmah Chief Manager (Mech. Maint.)	<u>Approved by:</u> S Chakraborty Dy. General Manager (Maint.)
--	---	--

 NUMALIGARH REFINERY LIMITED (A GOVT. OF INDIA ENTERPRISE)	INSPECTION AND TEST PLAN. FORGED, SEAMLESS & WELDED FITTINGS	MECHANICAL MAINTENANCE DEPT.
DOC. NO. NRL-ITP-PF REV.00 DTD. 01.12.2021		Page 1 of 6

INSPECTION AND TEST PLAN FOR FORGED, SEAMLESS & WELDED FITTINGS

Rev. no	Date	Purpose	Prepared by	Checked by	Standard committee convenor

 NUMALIGARH REFINERY LIMITED (A GOVT. OF INDIA ENTERPRISE)	INSPECTION AND TEST PLAN. FORGED, SEAMLESS & WELDED FITTINGS	MECHANICAL MAINTENANCE DEPT.
DOC. NO. NRL-ITP-PF REV.00 DTD. 01.12.2021		Page 2 of 6

Abbreviations:

CIMFR	:	Central Institute of Mining & Fuel Research	:	NDT	:	Non-Destructive Testing
CE	:	Carbon Equivalent	:	NPSH	:	Net Positive Suction Head
DFT	:	Dry Film Thickness	:	PO	:	Purchase Order
DPT	:	Dye Penetrant Testing	:	PESO	:	Petroleum Explosive Safety Organization
DHT	:	De-hydrogen Heat Treatment	:	PQR	:	Procedure Qualification Record
ERTL	:	Electronics Regional Test Laboratory	:	PR	:	Purchase Requisition
FCRI	:	Fluid Control Research Institute	:	PMI	:	Positive Material Identification
HT	:	Heat Treatment	:	RT	:	Radiography Testing
HIC	:	Hydrogen Induced Cracking	:	SSCC	:	Sulphide Stress Corrosion Cracking
ITP	:	Inspection and Test Plan	:	TC	:	Test Certificate
IP	:	Ingress Protection	:	TPI or TPIA	:	Third Party Inspection Agency
IHT	:	Intermediate Heat Treatment	:	UT	:	Ultrasonic Testing
IC	:	Inspection Certificate	:	VDR	:	Vendor Data Requirement
IGC	:	Inter Granular Corrosion	:	WPS	:	Welding Procedure Specification
MPT/MT	:	Magnetic Particle Testing	:	WPQ	:	Welders Performance Qualification
MTC	:	Material Test certificate	:	MRT	:	Mechanical Run Test

	NUMALIGARH REFINERY LIMITED (A GOVT. OF INDIA ENTERPRISE)	INSPECTION AND TEST PLAN. FORGED, SEAMLESS & WELDED FITTINGS	MECHANICAL MAINTENANCE DEPT.
DOC. NO. NRL-ITP-PF REV.00 DTD. 01.12.2021			Page 3 of 6

1.0 SCOPE

This Inspection and Test Plan covers the minimum testing requirements of Forged, Seamless & Welded Fittings.

2.0 REFERENCE DOCUMENTS

PO/PR/Standards referred therein/ Job specifications /Approved documents.

3.0 INSPECTION AND TEST REQUIREMENTS

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	NRL/TPIA
1.0	Procedure						
1.1	Heat Treatment / NDT	Documented Procedures	100%	Procedure Documents	-	H	R
1.2	WPS, PQR & WPQ	Welding Parameters & Qualification	100%	WPS, PQR & WPQ	-	H	W- New R- Existing
2.0	Material Inspection						
2.1	Raw Material Identification (Billets, Rounds, Pipes, Coil, Plates, etc.)	Chemical and Mechanical Properties	100%	Mill test certificate, Supplier's Inspection Report	-	H	R

	NUMALIGARH REFINERY LIMITED (A GOVT. OF INDIA ENTERPRISE)	INSPECTION AND TEST PLAN. FORGED, SEAMLESS & WELDED FITTINGS	MECHANICAL MAINTENANCE DEPT.
DOC. NO. NRL-ITP-PF REV.00 DTD. 01.12.2021			Page 4 of 6

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	NRL/TPIA
3.0	In Process Inspection						
3.1	Forming & Welding	Forming & Welding Parameters	100%	Supplier's records	-	H	-
3.2	Ferrite Check of SS Welds (If Applicable)	% Ferrite Check	100%	Inspection Report	-	H	R
3.3	Heat Treatment	Stress Reliving, Normalising, Tempering, Solution Annealing, Stabilization Heat Treatment etc. as applicable	100%	HT chart / Report	-	H	R
3.4	NDT As Applicable	Surface & Internal Imperfections	As per PR/Purchase Specification	NDT Reports	-	H	R
3.5	Identification of Test Samples	Product Chemical, Mechanical, Impact, IGC and other test as applicable	100%	Test Reports	-	H	H (Note 7)
3.6	Product Analysis	Chemical Composition	As per PR/Purchase Specification	Test Reports	-	H	R
3.7	Destructive Testing	Mechanical, Impact, IGC	100%	Test	-	H	H

 NUMALIGARH REFINERY LIMITED (A GOVT. OF INDIA ENTERPRISE)	INSPECTION AND TEST PLAN. FORGED, SEAMLESS & WELDED FITTINGS	MECHANICAL MAINTENANCE DEPT.
		Page 5 of 6

DOC. NO. NRL-ITP-PF REV.00 DTD. 01.12.2021

		and Other test as applicable		Reports			(Note 7)
--	--	------------------------------	--	---------	--	--	----------

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	NRL/TPIA
3.8	Galvanizing (If Applicable)	Integrity Of Galvanised Coating	100%	Inspection Report	-	H	R
4.0	Final Inspection						
4.1	Visual and Dimension	Size, Thickness / Schedule, Dimensions, Surface quality, Marking, etc.	100%	Inspection Report	-	H	RW
4.2	PMI Check	Chemical Check	As Per NRL Spec. 6-81-0001	Inspection Report	-	H	R
4.3	Final Stamping	Stamping Of Accepted Fittings	Stamping of Fittings which are witnessed by NRL/TPIA.	Inspection Report	-	H	-
5.0	Painting						
5.1	Rust Preventive Coating & Color Coding	Visual & Color Coding as Applicable	100%	Inspection Report	-	W	R
6.0	Documentation & IC						

	NUMALIGARH REFINERY LIMITED (A GOVT. OF INDIA ENTERPRISE)	INSPECTION AND TEST PLAN. FORGED, SEAMLESS & WELDED FITTINGS	MECHANICAL MAINTENANCE DEPT.
DOC. NO. NRL-ITP-PF REV.00 DTD. 01.12.2021			Page 6 of 6

SL.NO.	STAGE/ACTIVITY	CHARACTERISTICS	QUANTUM OF CHECK	RECORD	SCOPE OF INSPECTION		
					SUB SUPPLIER	SUPPLIER	NRL/TPIA
6.1	Documentation & Inspection Certificate (IC)	Review of Stage Inspection Reports / Test Reports & Issue of IC	100%	Supplier TC & IC	-	H	H

Legend: H- Hold (Do not proceed without approval), P-Perform, RW - Random Witness (As specified or 10% (min.1 no. of each size and type of Bulk item), R- Review, W-Witness (Give due notice, work may proceed after scheduled date).

NOTES (As applicable):

- H2 service/NACE/IBR requirements shall be ensured in compliance with clause 3.11,3.13 & 3.14 of MM/TECH/04/2010 Rev. 00 & attached documents *NRMPs-PF-2021-1.1 REV.0 dtd. 01.12.2021 & NRMPs-PF-2021-1.2 REV.0 dtd. 01.12.2021*
- Dimension checking +UTG --10% at random for CS items and 100% for SS and alloy steel items. **For Elbows UTG to be done at minimum 03 locations along the axis (of which 01 reading should be taken at the bend outer radius) & at min 04 points along the circumference.**
- 100 % PMI for all SS & alloy steel items shall also performed in compliance with PO terms.
- IGC-E test for SS items shall also be complied as per PO requirement.
- All SS Materials shall be dual certified like material specified as F316 / WP 316/ Type 316 for both SS 316 & 316L, as F304/WP304/Type 304 for SS 304 & 304L, as F321/WP321/Type 321 for SS321 & SS321H
- CS & LTCS fittings shall be fully killed and fine grained and shall be supplied in normalized or normalized and tempered condition.
- For Non-NACE & Non-Hydrogen service Carbon Steel Fittings up to size 14" will be accepted on review of Supplier Test Certificates. Supplier Test Certificate to be reviewed by NRL/TPIA.
- This document describes the generic test requirements. Any additional test or Inspection scope if specified in contract documents shall also be applicable. (Unless otherwise agreed upon).
- Acceptance Norms for all the activities shall be as per PO/PR/STANDARDS referred there in /Job Specification /Approved Documents.
- For Low Temperature Carbon Steel (LTCS) materials specified in the Purchase Requisition for flanges and fittings, the Charpy V-notch test requirement of applicable material standard as per ASME B31.3 to be done.

Numaligarh Refinery Limited
(A Govt. of India Enterprise)



REQUIREMENT FOR WET H₂S SERVICES (AXN1, AXN2 & AXN3) APPLICABLE TO CARBON STEEL.

JOB: PROCUREMENT OF FLANGES & PIPE FITTINGS

NRMPS-PF-2021-1.1 REV.0 dtd. 01.12.2021

Supply of Flanges & Pipe Fittings

NUMALIGARH REFINERY LIMITED

1.0 GENERAL

This document defines job specific requirements for NACE items under AXN1, AXN2 & AXN3 for Carbon Steels.

2.0 REQUIREMENTS OF 'AXN1', 'AXN2' AND 'AXN3' ITEMS APPLICABLE TO CARBON STEELS

2.1 All "AXN1" Carbon steel items shall meet the following requirements:

- a) Requirements as per NACE MR0103
- b) Requirements for Carbon Steels "Wet H2S Resistant" as elaborated in this document.

2.2 All "AXN2" Carbon steel items shall meet the following requirements:

- a) Requirements as per NACE MR0103
- b) Requirements for Carbon Steels "Wet H2S Resistant" as elaborated in this document.
- c) Special requirements for Hydrogen service as given in Technical Notes for the item or as given in attached document, "SPECIAL REQUIREMENT FOR HYDROGEN SERVICE FOR PIPING MATERIAL" (*refer attached document: NRMPS-PF-2021-1.2 REV.0 dtd. 01.12.2021*)

2.3 All "AXN3" Carbon steel items shall meet the following requirements:

- d) Requirements as per NACE MR0103
- a) Requirements of Carbon Steels "HIC Resistant" as elaborated in this document.

3.0 REQUIREMENTS OF CARBON STEELS 'WET H2S RESISTANT'

3.1 **Following are the design requirements for Carbon Steels "Wet H2S resistant":**

- Carbon steel must be fully Killed Carbon Steel type,
- Hardness of the base metal shall be below 22HRC or 237 HB
- Ni content less than 1%,
- Carbon content shall be 0.20% maximum,
- CS base material shall be supplied in Normalized condition (or Quenched and Tempered), regardless of thickness,
- Typical limitation of Carbon Equivalent are the following:
Ceq < 0.42% for thicknesses below 2"
Ceq < 0.45% for thicknesses above or equal to 2"
With Ceq = $C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15$

Supply of Flanges & Pipe Fittings

NUMALIGARH REFINERY LIMITED

- Thermal Stress Relieving (PWHT) required for all welds, even if it is not required by code.
- Thermal Stress Relieving required for cold bend zones even if it is not required by code. Level of deformation may require recovery annealing to restore properties of steels.
- Hardness of the production welds shall be lower than 200HB. This value uses to be slightly lower than the one defined for base metal (22HRC or 237HB) in order to anticipate potential non-homogeneity of certain weld deposits.

3.2 Wet H2S Resistant Carbon Steel for Plates and Welded pipes

All the specifications given in clause 3.1 are applicable and shall be supplemented by following limitations:

- Maximum allowable Phosphorus content **0.020%**
- Maximum allowable Sulfur content **0.015%**

Welded pipes shall fulfill the same requirements as for plate material.

3.3 Wet H2S Resistant Carbon Steel for seamless piping

- Small and medium size process piping shall be seamless type.

All the specifications given in clause 3.1 are applicable and shall be supplemented by following limitations on impurities level:

- Maximum allowable Phosphorus content **0.030%**
- Maximum allowable Sulfur content **0.020%**

3.4 Wet H2S Resistant Carbon Steel for flanges , fittings and accessories

All the specifications given in clause 3.1 are applicable and shall be supplemented by following limitations on impurities level:

- Maximum allowable Phosphorus content **0.030%**
- Maximum allowable Sulfur content **0.025%**

4.0 REQUIREMENTS OF CARBON STEELS 'HIC RESISTANT'

4.1 When „HIC" is specified, in addition to the recommendations relative to „Wet H2S resistant steels", the following requirements shall also be met:

- Carbon steel made by vacuum degassing process.
- Oxygen content less than 0.0025% (target being 0.0020%)
- It is required to pass the NACE standard TM0284-2003 (Evaluation of Pipeline and Pressures Vessels Steels for Resistance to Hydrogen-Induced Cracking) by using the acidified test solution A specified in NACE standard TM0177 (Laboratory

Supply of Flanges & Pipe Fittings

NUMALIGARH REFINERY LIMITED

Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H₂S environments) with:

Crack Length Ratio (CLR) $\leq 5\%$

- Mill test reports shall include the values for the crack length ratio (CLR), crack sensitivity ratio (CSR) and crack thickness ratio (CTR) as defined in NACE standard TM-0284 and also carbon equivalent (Ceq).

4.2 HIC Resistant Carbon Steel for Plates and Welded pipes

All the specifications given at clause 4.1 are applicable and shall be supplemented by following limitations on impurities level:

- Maximum allowable Phosphorus content **0.010%** (target 0.008%)
- Maximum allowable Sulfur content **0.002%**

Welded pipes, if any, shall fulfil the same requirement as for plate material.

4.3 HIC Resistant Carbon Steel for seamless piping

All the specifications given at clause 4.1 are applicable and shall be supplemented by following limitations on impurities level:

- Maximum allowable Phosphorus content **0.010%** (target 0.008%)
- Maximum allowable Sulfur content **0.002%**

4.4 HIC Resistant Carbon Steel for flanges, fittings and accessories

All the specifications given at clause 4.1 are applicable and shall be supplemented by following limitations on impurities level:

- Maximum allowable Phosphorus content **0.025%**
- Maximum allowable Sulfur content **0.020%**

Note- No HIC testing is required on casting and forging components. However, "Wet H₂S resistant" requirements given at clause 3.1 and above limitations on impurities level shall be met.

Numaligarh Refinery Limited
(A Govt. of India Enterprise)



**SPECIAL REQUIREMENT FOR HYDROGEN SERVICE FOR
PIPING MATERIALS**

JOB: PROCURENT OF FLANGES & PIPE FITTINGS

NRMPS-PF-2021-1.2 REV.0 dtd. 01.12.2021

Supply of Flanges & Pipe Fittings

NUMALIGARH REFINERY LIMITED

1.0 GENERAL

These requirements are applicable in addition to the requirements specified in the Piping Material Specifications.

2.0 PIPES, FLANGES AND FITTINGS

2.1 Method of Manufacture

All carbon steel pipes, fittings and flanges having wall thickness 9.53 mm and above shall be normalised. Cold drawn pipes and fittings shall be normalised after the final cold draw pass for all thicknesses. In addition, fittings made from forgings shall have Carbon - 0.35% max. and Silicon - 0.35% max. The normalising heat treatment shall be a separate heating operation and not a part of the hot forming operation.

All alloy steel (Cr-Mo) pipes, forgings and fittings shall be normalised and tempered. The normalising and tempering shall be a separate heating operation and not a part of the hot forming operation. The maximum room temperature tensile strength shall be 100,000 psi.

2.2 Impact Test

For all carbon steels and alloy steels pipes, flanges and fittings with thickness over 20 mm, Charpy-V Notch impact testing shall be carried out in accordance with paragraph UG-84 of ASME Section VIII, Div-1 for weld metal and base metal from the thickest item per heat of material and per heat treating batch. Impact test specimen shall be in complete heat-treated condition and in accordance with ASTM A370. Impact energies at 0 C shall average greater than 27J (20 ft-lb) per set of 3 specimens, with a minimum of 19J (15 ft-lb).

If welding is used in manufacture, impact test of Heat Affected Zone (HAZ) and weld metal shall also be carried out.

2.3 Hardness

For carbon steel pipes and fittings, hardness of weld and HAZ shall be limited to 200 BHN (max.). For alloy steel pipes and fittings, hardness of weld and HAZ shall be limited to 225 BHN (max.).

3.0 VALVES

3.1 All valve castings shall be of radiographic quality.

3.2 All cast valve flanges & bodies with flange rating of Class 900 or greater shall be examined in accordance with paragraphs 7.2 through 7.5 of Appendix-VII of ASME SEC-VIII, DIV.1, regardless of casting quality factor.

3.3 Only Normalized and Tempered material shall be used in the following specifications:

Castings: A217 Gr.WC1, A217 Gr.WC4, A217 Gr.WC5, A217 Gr.WC6, A217 Gr.WC9,
A217 Gr.C5, A217 Gr.C12

Supply of Flanges & Pipe Fittings

NUMALIGARH REFINERY LIMITED

Forgings: A182 Gr. F11 Cl.2

- 3.4 Body / bonnet / cover joints & stuffing box of valves shall have low emission. One valve per metallurgy, per rating, per size shall be helium leak tested as per ASME Sec.V, Subsection A, Article 10 (Detector Probe Technique), Appendix IV at a minimum of 25% of the allowable (rated) cold working pressure. Selection of valves for helium leak test shall be at random. Test duration shall be as follows:

Test Duration in Minutes					
Nominal Size	Pressure Class				
	Upto 300	600	800 & 900	1500	2500
Upto 2"	3	6	9	12	12
3" to 6"	6	9	12	15	18
8" to 16"	9	9	12	15	18
18" to 24"	9	12	15	18	21

The valve shall show no leakage. No leakage is defined as a total leakage rate of less than 0.0001 ml/s of helium.

- 3.5 CS & AS Valves:

Bend test and Magnetic Particle inspection of the entire surface of body and bonnet casting shall be in accordance with ASTM A217. Supplementary requirement S3 & S4 evaluation of magnetic particle, inspection shall be in accordance with MSS-SP-53 except that no linear discontinuities shall be allowed.

The Brinell hardness of heat-treated casting shall not exceed 200 BHN for carbon steel & 225 for alloy steel.

Repair of defective casting shall be outlined in writing to the purchaser before repair starts. Repair method to be approved prior to welding.

Casting shall be preheated to a minimum of 400°F prior to welding and all Chromium-Molybdenum alloys shall be post weld heat treated after welding is complete. Stress relieving is essential for welds.

Carbon steel shall be normalised, and alloy steels shall be normalised & tempered.

Dye Penetrant test of welds shall be in accordance with ASTM B165 Procedure B-2. Interpretation as per Appendix-8 of ASME-VIII Div.1.

The tensile stress for AS shall be less than 100,000 psi.

Charpy V-notch impact testing is to be done for valve material (average 20 ft-lb for set of 3 [minimum value 15 ft-lb] at 30 F).

For radiography and acceptance criteria for valve castings, refer para 2 of clause 3.6.

Supply of Flanges & Pipe Fittings

NUMALIGARH REFINERY LIMITED

3.6 SS Valves:

Casting and test bar shall be heat treated together. Valve casting shall be in solution heat treated and pickled condition.

Critical body and bonnet casing section typically defined by ASME B16.34 shall be radiographed and shall meet ASTM E446 (upto 2" thick) Category A,B & CA Level 2, Category CB, OC & CD Level 3, Category D,B & F Level 0. For wall thickness 2" to 4.5" comparable plates of ASTM E186 shall be used. ASTM E94 and ASTM E142 shall be used for recommended practice & controlling quality of radiography as guide. The entire surface of all castings shall be dye-penetrant inspected after pickling.

Repair welds shall be 100% radiographed and evaluated in accordance with paragraph 344.5 of ASME B31.3 with a minimum casting quality factor of 0.95. Dye Penetration test shall be as per ASTM E165 Procedure B-2, Interpretation as per Appendix-8 of ASME-VIII Div.1.

Numaligarh Refinery Limited
(A Govt. of India Enterprise)



PROCUREMENT OF FLANGES & PIPE FITTINGS

JOB: PURCHASE SPECIFICATION

NRMPS-PF-2021-1 REV.0 dtd. 01.12.2021

Terms & conditions for Flanges & Pipe fittings

A. Bid qualification Criteria:

1. Bidder shall be a manufacturer of Flanges & Pipe Fittings as per ASTM A105 /A234 GR. WPB/WPC/WPB5/WP9/WP11/A182/A403/A106Gr.B/Wet H2S service (AXN type) material standards meeting their required dimensional standards and shall have capability of manufacturing, testing, and supplying the Flanges & Pipe Fittings as per NRL specification.

Vendor's action: Bidder is required to submit list of machineries, catalogue/brochures indicating their manufacturing and testing facilities

Vendor's action: Vendor shall confirm and substantiate all above conditions through proper documents.

2. The Bidder shall have successfully executed Purchase Orders for supply of Flanges/Pipe Fittings as per ASTM A 105 / A106 Gr.B, A or A234 GR. WPB/WPC or A234 GR.WP5/P9/P11/A182 or Wet H2S service (AXN* type) and A403 GR 304/316 and Inconel material standards combined or individually, to any processing plant or any other industry directly or through project consultant(s), in any of the 12 consecutive months period during preceding 5 years counting prior to tender due date and shall not be less than Rs. 10 lakhs.

The order value criteria mentioned above shall be basic cost without taxes and duties.

Vendor's action: Bidder is required to submit relevant Purchase order copies and invoices / Inspection Release Notes / completion certificates or any other such documents as proof of meeting this requirement.

Note: Bidders to submit the duly filled in CHECKLIST attached with this tender. Non submission of the check list may lead to rejection of the offer.

***REQUIREMENTS OF 'AXN1', 'AXN2' AND 'AXN3' (refer attached document: NRMPs-PF-2021-1.1 REV.0 dtd. 01.12.2021)**

B. GENERAL CONDITIONS:

1. Materials shall be delivered within 16 weeks from the placement of Order/LOI on FOR basis to NRL site.
2. Nil Deviation certificate/declaration with regards to tender technical conditions specifying specific tender details.
3. Bidder's must confirm that in the event of an order being placed on them, the delivery schedule mentioned at sl. No. 3 above, will be adhered to. Non-compliance of the same shall be considered as violation of PO terms & Conditions and the agency may be barred from participating in future tender of NRL, for a period as deemed fit by NRL.

C. TECHNICAL CONDITIONS:

1. Mill/Manufacturer test certificate with proper correlation to each item, which shall include chemical & mechanical test results, shall be provided.

2. 100% PMI & UTG thickness gauging report of each item with proper correlation for all SS & alloy type of Flanges & Pipe Fittings. 10% PMI & UTG at random for each item & for each lot (if lot sizes are less than 10 nos. then 100% PMI & UTG is applicable) for CS Flanges & Pipe Fittings.
3. Thinning **allowance for Elbows shall not be permitted.** All items shall be supplied in accordance with the wall thickness or schedule as stated in Inquiry / Purchase requisition. Wall thickness heavier or thinner than specified tolerance at any sections shall not be accepted.
4. The items shall be supplied as per Tender specification, applicable codes, standards, specifications specified in the respective item descriptions. Vendor shall submit sealed & signed copy of the same as a token of acceptance of the same.
5. Following technical documents in addition to item specification shall govern the individual category of items:
 - a. NRMPS-PF-2021-1.1 REV.0-WET H2S service requirement
 - b. NRMPS-PF-2021-1.2 REV.0 - Hydrogen service requirement
 - c. Flanges & Pipe Fittings: MM/TECH/04/2010
 - d. AXN
 - e. **DSS EIL**
6. The items shall be subjected to inspection by Third Party Inspection Agency (TPIA). The vendor shall develop their Quality Assurance plan (QAP) for material in line with Tender specification and NRL ITP (***NRL-ITP-PF REV.00 - ITP Fittings NRL***) enclosed with this tender.

TPIA shall issue inspection report and release note on their letterhead. All the documents (TPIA endorsed) along with original inspection report and release note shall be furnished with supplies.
7. Warrantee/guarantee certificate for a period of 18 months from the date of supply or 12 months from the date of installation ,whichever occurs first, to replace the item free of cost, if any discrepancies observed in between shall be provided.
8. All materials will be subjected to further inspection by NRL either at vendor premises or at NRL before final acceptance of the same.
9. Other Conditions as per NRL GPC.
10. Vendor shall furnish their offer with signed and stamped copy of all above technical conditions as a token of their acceptance.

D. OTHER TECHNICAL CONDITIONS:

1. **All welded items shall be 100% radio graphically examined to give a joint factor of 1.0.** All flanges & fitting shall be supplied seamless unless otherwise specified. Seamless is an acceptable alternative for welded pipe and fittings but vice-versa are not acceptable.
2. All CS & LTCS materials shall be fully killed and fine grained and shall be produced by a low sulphur and low phosphorous refining process. The components shall be supplied in normalized or normalized and tempered condition.
3. **All Austenitic stainless steel, duplex stainless-steel items shall be supplied in solution annealed and quenched condition as per corresponding ASTM standard.**
4. **Austenitic stainless steel shall be capable of passing an inter-granular corrosion test in accordance with ASTM A262, Practice E.**
5. **Dimensions of butt-welded fittings shall be in accordance with ASME B16.9. Forged threaded and socket welded fittings shall be in accordance with ASME B16.11. Other fittings dimensions shall comply with MSS SP-75, MSS SP-95, MSS SP-97 or BS 3799 as applicable. Vendor shall provide calculations as per ASME B31.3 for the fittings not covered under the above-mentioned standards.**
- 6.

7. **All screwed fittings shall be threaded NPT in accordance with ASME B1.20.1.**
8. Branch reinforcing fittings (i.e. sockolets, weldolets etc.) shall be designed in accordance with the requirements of ASME B31.3. The vendor shall submit drawings during bid stage and calculations for review and approval after award of contract.
9. Butt weld elbows shall be long radius type (radius = 1.5 nominal pipe size). Short radius elbows are not permitted.
10. **For reducing fittings specified with two schedules in the Inquiry / Purchase description, the first schedule refers to the larger end or run pipe, the second schedule refers to the smaller end or branch pipe.**
11. Fittings shall be forged to the final shape and size. **Fittings shall not be machined from bar stock or solid forged billets without specific approval.**
12. Union dimensions shall be in accordance with BS 3799.
13. Galvanizing of fittings shall be in accordance with ASTM A153. Threaded portion of fittings shall be supplied with threads free of galvanizing.
14. Swage nipple shall be pipe swaged by forging only. Machining of bar stock, forgings or heavy wall pipe not permitted. Dimensions shall be in accordance with MSS-SP-95.
15. **All reduction sizes for tees and reducers to be in accordance with ASME B16.9.**
16. **CS & LTCS fittings shall be fully killed and fine grained and shall be supplied in normalized or normalized and tempered condition.**
17. 100% of CS & LTCS welded fittings, with wall thickness greater than Sch 80 shall be examined by Magnetic Particle Examination for weld bevel ends. Acceptance standards shall be in accordance with ASME VIII Division 1, Appendix 6. This shall be done after final heat treatment.
18. 100% of CS, LTCS & SS forged fittings, with wall thickness greater than Sch 80 shall be examined by Magnetic Particle / Dye penetrant examination. Acceptance standards shall be in accordance with ASME VIII Division 1, Appendix 6 / 8. This shall be done after final heat treatment.
19. 100% of SS & DSS wrought fittings having wall thickness more than 20mm shall have the bevel and weld end over a width of 25mm, examined by Dye penetrant Method.
Acceptance standards shall be in accordance with ASME VIII Division 1, Appendix 8.
20. 100% of DSS welded fittings with a wall thickness greater than 30mm shall be 100% ultrasonically examined in accordance with ASME VIII Division 1.
21. 100% of DSS forged fittings weld bevels shall be examined by Dye Penetrant inspection.

E. NACE SERVICE REQUIREMENTS:

1. All materials specified for NACE service shall, as a minimum, meet the requirements of NACE MR0103 / ISO 17495-1 – latest edition.
2. All welded pipes / fittings in sour service shall be HIC tested, if required by the project specification. It shall be conducted for one pipe / fitting per heat in accordance with NACE TM-0284 Solution – A with acceptance criteria as specified in NACE MR-0103 – latest edition.

F. IMPACT TEST REQUIREMENTS

1. All CS, LTCS, welded austenitic and duplex stainless steel piping components shall be impact tested in accordance with ASME B31.3.
2. For carbon steel pipes and fittings, the impact test temperature shall be the 'minimum metal temperature' as defined in the project. The impact test requirement and acceptance criteria shall be as per Cl. 323.2.2 and Cl. 323.3.5 of ASME B31.3 respectively.

3. For LTCS items, the impact test temperature shall be (-460C). Test results shall be at least 27 joules as an average of three tests (for standard specimen 10 x 10 mm), one result may be lower, but not lower than 21 joules.
4. For welded SS and DSS items, the impact test temperature shall be the 'minimum metal temperature' as defined in the project but not more than (-1010C) and (-500C) respectively. For SS items, the acceptance criteria shall be as per Cl. 323.3.5 of ASME B 31.3. For DSS items, test results shall be at least 40 joules in transverse direction (for standard specimen 10 x 10 mm) as an average of three tests, one result may be lower but not less than 30 joules.
