



Bharat Heavy Electricals Limited
(A Govt. of India Undertaking)

Piping Centre , 80, G. N. Chetty Road, CHENNAI – 600 017
Phone : 91 (044) 28161245, Fax 044 28161 341 e-mail: prs@bhelmpc.co.in

REF: ENQ NO:PC1103

DT: 12.09.2011

Sub: Supply of forged flanges.

Ref: Enquiry No:PC1103 dt 12.09.2011

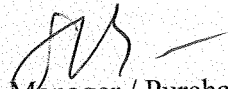
Please find the following tender documents for reference.

1. List of items and sample drawings
2. Tech. delivery condition TDG: 104:03.

Pre qualification is the criteria for consideration for other than BHEL approved vendors. After qualifying for registration, the new vendors may be considered for future requirements, in line with BHEL system and policy. Such vendors will not be considered for this enquiry.

This is a limited tender and only vendors who are contacted through e-mail/courier may submit their offers. Offers from other vendors will not be considered for this enquiry.

New vendors may download vendor registration forms from BHEL web site www.bhel.com and relevant data for formal registration.


Manager / Purchase
BHEL / Piping Centre
80,GN Road, T.Nagar
Chennai-600017
Ph: 044-28161243

Enquiry no: PC1103 dt 12.9.2011

LIST OF ITEMS

Sl no	Material code	DRAWING NO	Description	Quantity nos	Unit rate Rs.
1	925180210000	4 80 359 73364/01	WN FLANGE NB 250 CL 150 SA105	20	
2	925180220000	4 80 359 73361/01	WN FLANGE NB 100 CL 150 SA105	10	
3	925180300000	4 80 359 73381/01	WN FLANGE NB 200 CL 300 SA105	60	
4	925180330000	4 80 359 73378/01	WN FLANGE NB 100 CL 300 SA105	136	
5	925180340000	4 80 359 73375/01	WN FLANGE NB 50 CL 300 SA105	662	
6	925180420000	4 80 359 73370/01	WN FLANGE NB 500 CL 150 SA105	8	
7	925180470000	4 80 359 73392/01	WN FLANGE NB 100 CL 600 SA105	8	
8	925180810000	4 80 359 73395/01	WN FLANGE NB 250 CL 600 SA182F22CL3	6	
9	925180840000	4 80 359 73391/01	WN FLANGE NB 100 CL 600 A182F22CL3	12	
10	925180880000	4 80 359 73379/01	WN FLANGE NB 150 CL 300 SA182F22CL3	4	
11	925180970000	4 80 359 73389/01	WN FLANGE NB 500 CL 300 SA105	6	
12	925180990000	4 80 359 73368/01	WN FLANGE NB 400 CL 150 SA105	10	
13	925181010000	4 80 359 73371/01	WN FLANGE NB 600 CL 150 SA105	12	
14	925181020000	4 80 359 73383/01	WN FLANGE NB 250 CL 300 SA105	12	
15	925181160000	AS PER STANDARD	WN FLANGE NB 150 CL 150 SA105	70	
16	925181170000	AS PER STANDARD	WN FLANGE NB 200 CL 150 SA105	50	
17	925181350000	4 80 359 73396/01	WN FLANGE NB 350 CL 600 SA182F22CL3	10	
18	925185390000	4-80-359-73360/01	WELD NECK FLANGE 3 INCH CL150SA 105	120	
19	925185400000	4-80-359-73365/01	WELD NECK FLANGE 12 INCH CL150A182F304H	6	
20	925185410000	4-80-359-73366/01	WELD NECK FLANGE 12 INCH CL150SA 105	20	
21	925185420000	4-80-359-73367/01	WELD NECK FLANGE 14 INCH CL150SA 105	20	
22	925185430000	4-80-359-73369/01	WELD NECK FLANGE 18 INCH CL150SA 105	22	
23	925185440000	4-80-359-73372/01	WELD NECK FLANGE 28 INCH CL150SA 105	6	
24	925185450000	4-80-359-73373/01	WELD NECK FLANGE 32 INCH CL150SA 105	8	
25	925185460000	4-80-359-73374/01	WELD NECK FLANGE 2 INCH CL300A182F304H	6	
26	925185470000	4-80-359-73376/01	WELD NECK FLANGE 3 INCH CL300A182F22CL3	4	
27	925185480000	4-80-359-73377/01	WELD NECK FLANGE 3 INCH CL300SA 105	90	
28	925185490000	4-80-359-73382/01	WELD NECK FLANGE 8 INCH CL300A182F304H	4	
29	925185500000	4-80-359-73384/01	WELD NECK FLANGE 12 INCH CL300A182F304H	4	
30	925185510000	4-80-359-73386/01	WELD NECK FLANGE 14 INCH CL300SA 105	18	
31	925185520000	4-80-359-73387/01	WELD NECK FLANGE 16 INCH CL300A182F22CL3	6	

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LIST OF ITEMS

Sl no	Material code	DRAWING NO	Description	Quantity nos	Unit rate Rs.
32	925185530000	4-80-359-73388/01	WELD NECK FLANGE 16 INCH CL300SA 105	4	
33	925185540000	4-80-359-73390/01	WELD NECK FLANGE 3 INCH CL600A182F22CL3	78	
34	925185550000	4-80-359-73393/01	WELD NECK FLANGE 6 INCH CL600SA 105	6	
35	925185560000	4-80-359-73394/01	WELD NECK FLANGE 8 INCH CL600A182F22CL3	6	
36	925185570000	4-80-359-73397/01	WELD NECK FLANGE 16 INCH CL600A182F22CL3	10	
37	925185580000	AS PER STANDARD	WELD NECK FLANGE 24 INCH CL300SA 105	10	
38	925185590000	AS PER STANDARD	WELD NECK FLANGE 24 INCH CL600A182F22CL3	2	
39	925185600000	AS PER STANDARD	WNFLANGE NB 350 PN-10- BSEN 1902-2SA105	14	
40	925185610000	4-80-359-73472/02	WELD NECK FLANGE 1.5 INCH CL600 RTJSA105	52	
41	925185620000	4-80-359-73475/02	WELD NECK FLANGE 1.5 INCH CL300 RFSA 105	80	
42	925185630000	4-80-359-73481/02	WNFLANGE1.5INCHCL900/1500RTJA182F22CL3	16	
43	925185640000	4-80-359-73482/02	WNFLANGE1.5INCHCL2500RTJA182F22CL3	40	
44	925185650000	4-80-359-73633/01	WELDNECKFLANGE 1.5 INCH CL900 RTJSA 105	16	
45	925185660000	4-80-359-73634/01	WELDNECKFLANGE1.5INCHCL600RTJA182F22CL3	20	
				1784	



1.0 CODES

Materials shall meet Indian Boiler Regulations, (IBR) in addition to the latest Version of SA105 & SA182 as on date specified in the Purchase Order (PO).

2.0 RAW MATERIAL

(a) The raw material used shall meet the respective specification and the test certificate shall be furnished.

(b) Steel for SA 182 F11, F12 & F22 if indigenously procured, to be procured from following manufacturers i) Alloy Steel Plant, Durgapur, ii) Tata Iron & Steel company, Jamshedpur & iii) Mahindra Ugine Steel Company, Mumbai, who are approved by IBR for creep resistant steels.

(c) Carbon content of Carbon steel fittings (SA 105) shall be restricted to 0.25% max

3.0 PROCESS

(a) Process of manufacture shall conform to applicable standards.

(b) Unless otherwise specified in the P.O, SA182 F11/12 fittings shall be supplied as per class 2 and SA182 F22 shall be of Class 3 only.

4.0 HEAT TREATMENT

4.1 All fittings shall be heat treated as below:

SA 105	- Normalised
SA182 F11/ F12/ F22	- Normalised & Tempered

4.2 Fittings conforming to SA182 F91 shall be normalised at 1040 to 1070 deg C (for wall thickness larger than 75 mm, accelerated cooling may be done to obtain a fully martensitic structure) and tempered at 760 ± 10 deg C

5.0 TESTING

(a) Product analysis shall be carried out on One piece / Heat / HT lot / Size.

(b) Corrosion test (IGC) shall be carried out on one piece / Heat / HT lot / Size for SS fittings.

(c) All CS & AS items shall be tested by MPI as per ASTM E-709 & SS items by LPI as per E 165.

(d) Tension test shall be carried out on one Test piece for each specification, heat, heat treatment lot and size.

(e) Bend test for CS (SA 105) : One sample of 19 mm thick and 25mm width to be bent 180 deg around mandrel of radius 6.35mm.

(f) Bend test for AS (SA182): One Sample of 25.4 mm width and thickness = t to be bent 180 deg around mandrel of radius = 1.5 t. Test on representative sample is also acceptable.

S. Jayakumar, Engg

G.Panneer Selvam, QA

Approved by

K. Vedaprasad, QC

K. Ganeshan, MPL



- (g) Dimensions shall be as per Purchase Order.
- (h) **Metallography:-** Metallography shall be carried out on one per heat, per size, per heat treatment lot of WP91 / F91 fittings. Acceptance norms - The Material shall be free from any micro fissures. Microstructure shall show tempered martensite and also to be examined for any grain growth. Photomicrograph with 500x (Min) magnification along with Metallography report to be provided. The actual magnification shall be indicated.
- (i) Hardness test shall be carried out on all items of F91, and 10% on other material grades.
- (j) All items shall be ultrasonically tested as per SA388 and acceptance norms shall be as per 3.3.4 of ASME Sec VIII Div 2

6.0 POSITIVE MATERIAL IDENTIFICATION (PMI) FOR ALLOY STEEL FITTINGS.

Each alloy steel fitting shall be checked for the correctness of the material during manufacturing and final inspection using X-ray fluorescence principle or spark emission spectrography.

7.0 WORK MAN SHIP, FINISH AND REPAIR

All items shall have smooth, workman like finish, and to be free from scale & defects like laps, seams, folds, cracks, etc. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum dimension after repair shall meet drawing / Specification. Repairs by fusion welding are prohibited.

8.0 PAINTING , COLOUR CODING, MARKING, PACKING & END PROTECTION

- 8.1 **PAINTING :** All fittings except SS to be applied with resin type rust preventive coating with visibility to punched and stenciled details on outside and either with rust preventive coating or rust inhibitor inside. SS fittings to be surface treated as per ASTM A380 both inside and outside.

- 8.2 **COLOUR CODING :** All fittings shall be colour coded circumferentially at ends as given below

SA105	=	Blue
SA182 F11	=	Green & White
SA182 F12	=	Black & Red
SA182 F22	=	Blue & Red
SA182 F91	=	Brown & Red
SA182 F316	=	Black & Blue

8.3 MARKING :

- 8.3.1 The fittings dispatched to **BHEL Stores** shall be punched / etched with Material code, Heat number, material specification, maker's emblem, Inspectors seal and Statutory authorities seal (as applicable) .

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G.Panneer Selvam, QA		K. Vedaprasad, QC	
		K. Ganeshan, MPL	



In addition, the above details along with size shall be paint stenciled on the fittings

- 8.3.2 The fittings dispatched directly to project site as **DTS** shall be punched and paint stenciled with DU code (14 digit work order du detail) as given by purchase in addition to marking done as per para 8.3.1.

- 8.4 **PACKING AND END PROTECTION** : Machined ends of the fittings shall be well protected using end caps and fittings shall be suitably packed in box / crate to avoid transit & other damages.

9.0 **INSPECTION & CERTIFICATION :-**

All items are to be Inspected at the manufacturer's works by the Inspection agencies / authorities as per IBR and as indicated in the P.O. Inspection certificate in IBR Form IIIC (for items under IBR purview) shall be submitted along with the Work Test Certificate countersigned by any of the above authorities and shall include the following.

1. Test Certificate Number & date.
 2. BHEL P.O Number & Amendment Number(if any)
 3. BHEL P.O. Serial Number
 4. BHEL TDC Number
 5. Size-wise Quantity
 6. Specification, Grade & Year of code.
 7. Heat/Melt Number
 8. Steel making / forming process
 9. Ladle and product Analysis of Raw Material.
 - *10. Product analysis report.
 - *11. Heat Treatment Chart.
 - *12. NDE report. (VISUAL,MPI, LPI, UT)
 - *13. Tensile Test report
 - *14. Bend Test report.
 - *15. Hardness Test report
 - *16. Intergranular corrosion test report for SS
 17. Metallography Report along with photomicrograph with 500x (min) magnification.
 - *18. Dimensional conformance.
 - *19. Starting material details.
 - *20. Guarantee of HTP shall be given in the test certificate as follows if hydro test is not carried out :- "Forgings are capable of with standing without failure, breakage or impairment of their serviceability a hydrostatic test pressure equal to that prescribed for the specified matching pipe of equivalent material".
- *Details furnished in the Tests certificate in lieu of chart/report is acceptable.

10.0

Records of Revisions:-

Revision 02 : Material specification SA 182 F316 added.

Revision 03 : a) Para 4.0, 6.0 included.

b) Para 5.0 (b),(c),(h),(j), 8.0 and 9.0 (17) are revised.

S. Jayakumar, Engg

G.Panneer Selvam, QA

Approved by

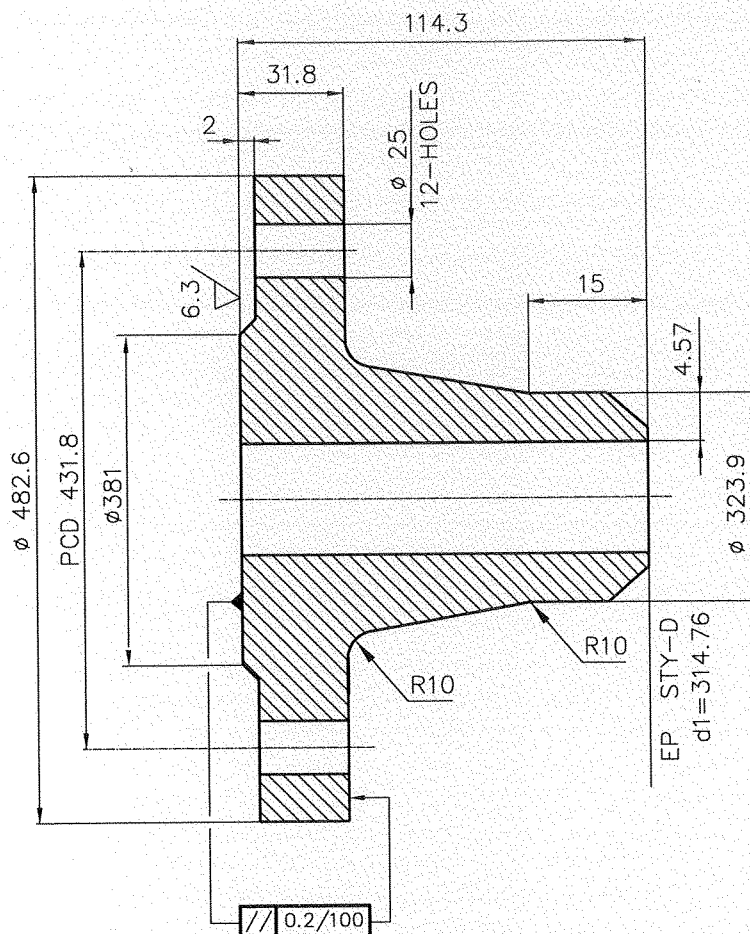
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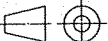
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REV 01	DATE 29.8.11	ALTERED : MANOJ APPROVED : SDM
WEIGHT INCORPORATED		

ALL DIMENSIONS ARE IN MILLIMETRES



VAR NO.	DESCRIPTION	STD	925185400000	A	UNIT	39	950
			A182 F 304H				
			MATL. CODE	A C	DI	UNIT.WT.(Kg)	
			MATL. SPECN.			QTY.	

		BHARAT HEAVY ELECTRICALS LIMITED PIPING CENTRE CHENNAI 600 017			NAME		SIGN	DATE	NO. OF VAR
					DRN	MANOJ		22.07.11	
					CHD	S.PANDA		22.07.11	
					APPD	APMK		22.07.11	
DEPT	GRADE OF UNTOL DIM		SCALE	WEIGHT (KG).	REF. TO ASSY./OLD DRG.			ITEM NO.	NO. OF ITEMS
CODE	C / M / F		N.T.S	39.950					
TITLE WELD NECK FLANGE 12 INCH CL 150					CARD CODE	DRAWING NO. 4-80-359-73365			REV 01
					U 01				