



An ISO 9001
Company

Bharat Heavy Electricals Limited

(High Pressure Boiler Plant)

Tiruchirappalli – 620014, TAMIL NADU, INDIA

MATERIALS MANAGEMENT

TITLE: Supply of Dished Ends to BHEL Trichy	Phone: +91 431 2577630 / 2575329 Fax : +91 431 2520 719 Email : nnithya@bheltry.co.in geetha@bheltry.co.in
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Reference Number: 1401400143	Date: 22.12.2014	Due date for submission of offer : 13.01.2015
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You are requested to quote the Enquiry number date and due date in all your correspondences. This is only a request for quotation and not an order.

Please note that under any circumstance both delayed offer and late offers will not be considered. Hence vendors are requested to ensure that the offer is reaching physically our office before 14.00 hrs on the date tender opening.

BHEL / Trichy is looking for Dished Ends to BHEL Trichy as per the attached documents.

BHEL technical terms & conditions and all annexures can be downloaded from BHEL web site <http://www.bhel.com> or from the Government tender website <http://tenders.gov.in> (public sector units) Bharath Heavy Electricals Limited) under reference “**1401400143**”

Offer should reach us before 14:00 hours on the due date of 13.01.2015.	Yours Faithfully, For Bharath Heavy Electricals Limited Sr. Engineer / MM / Purchase - C&F
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General Note: **BHARAT HEAVY ELECTRICALS LIMITED**

Page:1/2

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

PHONE : 2577480
GRAMS : BHARATELEC
FAX NO: 2520719
E-mail :
Web :

429-002/A

OFFICE COPY

Collective No.

1401400143

Enquiry Date

22.12.2014

Due Date For
Quotation

13.01.2015

Please quote Enquiry No, Date and due date in all
correspondences.
This is only a request for quotation and not an order

Item	Description	Unit	Quantity	Delivery Quantity	Schedule Date
10	920840110000 HSEC D812.8 X 105(MIN) SA234WP12CL1 3-07-125-13135	NO	4.000	4.00	31.07.15
20	920841930000 HSDE OD 660x81.25-SA234WP91 3-04-321-02705	NO	16.000	16.00	30.06.15
30	920841940000 HSDE OD 762 x 90.25(NOM) - SA234WP91 3-04-323-02706	NO	8.000	8.00	30.06.15
40	920842250000 HSEC D812.8 X 90 - SA234WP91 3-04-321-02749	NO	8.000	8.00	31.07.15
50	920849550000 HSEC D559 X 68(NOM) - SA182F12CL2 3-04-000-02990	NO	10.000	10.00	31.07.15
60	920849750000 HSEC-OD812.8X90(MIN)/SA234WP12CL1 3-07-125-11249	NO	4.000	4.00	30.06.15

General Note:

1. Terms and Conditions are attached along with the enquiry.

Enclosures:

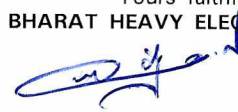
"LD clause has to be confirmed without fail."

PR Links

Material.	PR.No	PR.Item.	Quantity	Acc. Assign	Customer Number
920840110000	109261817	00010	2.000	U6/1723	U6/1723
920840110000	109261817	00020	2.000	U6/1724	U6/1724
920841930000	109056214	00010	8.000	U8/1809	U8/1809

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of
tenderers who have submitted their offer and who may like to be present for the tender
opening.Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**


MANAGER / PURCHASE
(FOSSIL BOILERS)



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)
HIGH PRESSURE BOILER PLANT
PURCHASE DEPARTMENT - FOSSIL BOILERS
THIRUCHIRAPALLI - 620014
TAMILNADU (INDIA)

Page:2/2

1401400143 / 22.12.2014

23505

Material.	PR.No	PR.Item.	Quantity	Acc. Assign	Customer Number
920841930000	109065259	00010	8.000	U8/1810	U8/1810
920841940000	109056214	00020	4.000	U8/1809	U8/1809
920841940000	109065259	00020	4.000	U8/1810	U8/1810
920842250000	109224187	00010	4.000	U6/1723	U6/1723
920842250000	109224187	00020	4.000	U6/1724	U6/1724
920849550000	109066232	00010	10.000	U5/0684	U5/0684
920849750000	109077002	00010	2.000	U8/1809	U8/1809
920849750000	109077002	00020	2.000	U8/1810	U8/1810


list of suppliers

RFQ-5200003574

Open Tender Dummy Code

The offers should reach us 30 minutes before the time of opening of tenders.
The offers will be opened at 14.30 hrs on the due date of tender in the presence of tenderers who have submitted their offer and who may like to be present for the tender opening. Late and delayed offers are liable to be rejected.

Yours faithfully,
For **BHARAT HEAVY ELECTRICALS LIMITED**

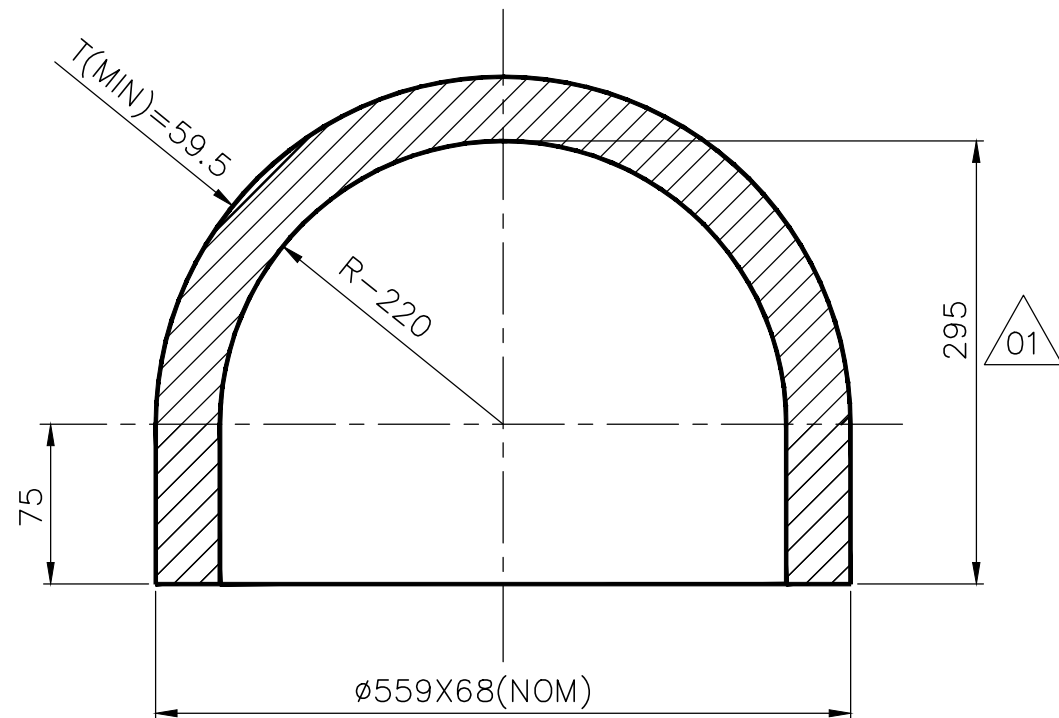

MANAGER / PURCHASE
(FOSSIL BOILERS)
Yours faithfully,

06620-000-40-3
DRAWING NO:

ALL DIMENSIONS ARE IN MM
FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER RELEVANT QCP / QP

NOTES:

01. DESIGN MANUFACTURE AND INSPECTION AS PER IBR.
02. FOR TOLERANCES REFER STD.DRG.NO: 4-03-000-00053.
03. ALL DIMENSIONS SHOWN ARE FINISHED DIMENSIONS.
04. NORMALISING AND TEMPERING IS TO BE DONE AFTER FORMING.
05. NO THICKNESS GREATER THAN 152.4mm SHALL BE USED WITHOUT PRIOR BHEL APPROVAL.
06. FITTING SPECIFICATION : SA182 F12 CL2
07. THE HEMISPHERICAL END COVER SHALL BE SUPPLIED WITH PLAIN END.
08. FITTING MATERIAL CODE-920849550000



VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C	UNIT	UNIT WEIGHT	QTY
		HS END COVER ø559; T=68(NOM)		02		SA182 F12 CL2	A		243.800	
					VAR NO	MATERIAL SPECN	D1		QUANTITY	

REV	DATE	ALTERED : KRISHNA R.	REV	DATE	ALTERED : KRISHNA R.
02	02.12.14	CHD & APPD: B.KORAH	01	17.09.14	CHD & APPD: B.KORAH
ZONE	MATERIAL SPEC. CHANGED FROM SA234WP12CL1 TO SA182F12CL2.		ZONE	HEIGHT CORRECTED.	

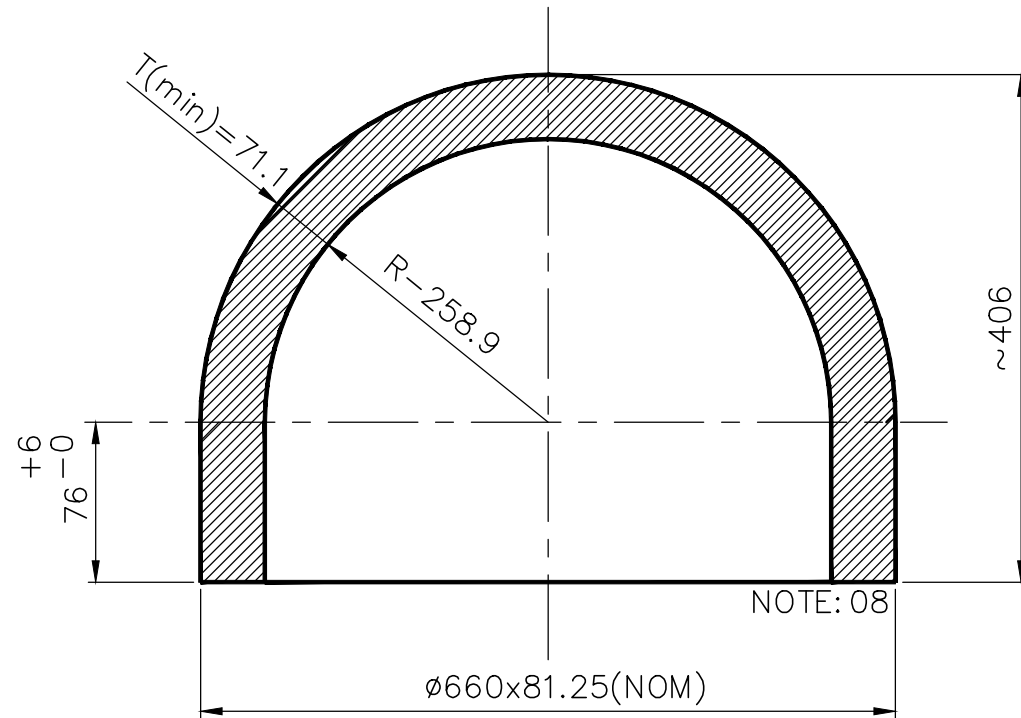
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT					
		Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014	DRN	NAME	SIGNATURE	DATE	NO. OF VAR
			CHD	B.KORAH		11.08.14	
DEPT	PP	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG	ITEM NO	No OF ITEMS	
CODE	121	NTS	243.800				
TITLE	DISHED END COVER			CARD CODE	DRAWING NO :	REV	
	ø559; T=68(NOM)			U 01	3-04-000-02990	02	

DRAWING NO: 3-04-321-02705

ALL DIMENSIONS ARE IN MM
FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER RELEVANT QCP / QP

NOTES:

01. DESIGN MANUFACTURE AND INSPECTION AS PER IBR.
02. FOR TOLERANCES REFER STD.DRG.NO: 4-03-000-00053.
03. ALL DIMENSIONS SHOWN ARE FINISHED DIMENSIONS.
04. NORMALISING AND TEMPERING IS TO BE DONE AFTER HOT FORMING.
05. NO THICKNESS GREATER THAN 152.4mm SHALL BE USED WITHOUT PRIOR BHEL APPROVAL.
06. FITTING SPECIFICATION : SA234 WP91
08. THE FORMED HEMISPHERICAL END COVER SHALL BE SUPPLIED WITH PLAIN END.



FITTING MATERIAL CODE: 920841930000

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C	UNIT	UNIT WEIGHT	CS
					VAR NO	MATERIAL SPECN		D1	QUANTITY	
		HS END COVER				SA 234 WP91		A	400.000	

REV	DATE	ALTERED :K.S.
01	31.07.12	CHD & APPD: RAJA.K.
ZONE	NOTE -7 DELETED.	

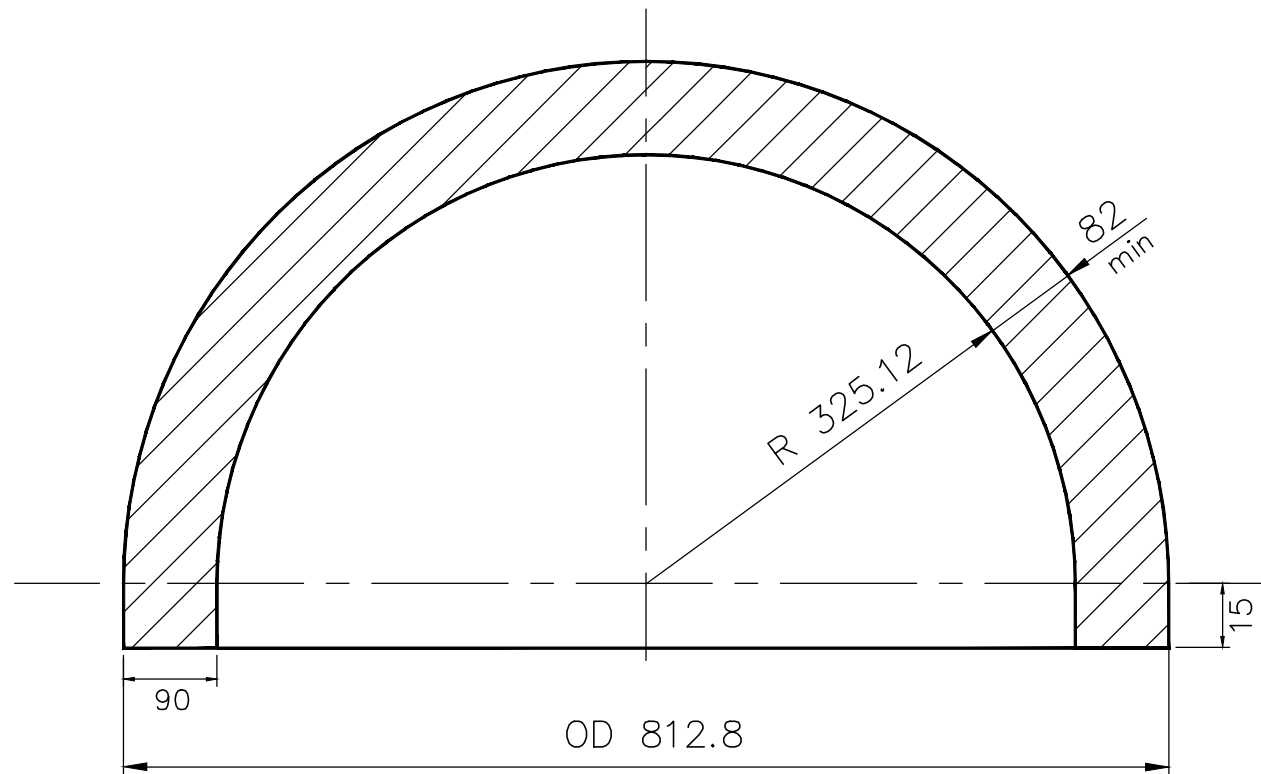
CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.										
TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT										
Bharat Heavy Electricals Ltd UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014			DRN	NAME K.S	SIGNATURE	DATE	NO. OF VAR			
			CHD	I.K.S		04.02.10				
			APPD	I.K.S		04.02.10				
DEPT	PP	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG	ITEM NO	No OF ITEMS				
CODE	121	NTS	400.000	F-31						
TITLE				CARD CODE	DRAWING NO :	REV				
HEMISPHERICAL END COVER				U 01	3-04-321-02705	01				
RAW FORMING D660x81.25(NOM)										

3-04-321-02749
DRAWING NO:

FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER PLANT STD.NO TP 023 0299

NOTES:

01. DESIGN MANUFACTURE AND INSPECTION AS PER IBR.
02. FOR DESIGN PARAMETERS, REFER ASSEMBLY DRG.
03. FOR TOLERANCES REFER STD.DRG.NO:4-03-000-00053.
04. NORMALISING AND TEMPERING IS TO BE DONE AFTER HOT FORMING.
05. FITTING SPECIFICATION : SA 234 WP91



01

VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C/P	UNIT	UNIT WEIGHT	CS
		RAW MATL.					A		639.000	
					VAR NO	MATERIAL SPECN		DI	QUANTITY	

FITTING MATERIAL CODE: 92 084 225 0000

REV	DATE	ALTERED : YADAV
01	07.01.13	CHD & APPD: S.A.K
ZONE	NOTE 06 DELETED, BOM CORRECTED.	

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.

TYPE OF PRODUCT
OR NAME OF
CUSTOMER/PROJECT



Bharat Heavy Electricals Ltd
UNIT: HIGH PRESSURE BOILER PLANT
TIRUCHIRAPALLI - 620014

DRN	NAME PRAVEEN	SIGNATURE	DATE 31.12.10
CHD	CLR		02.01.11
APPD	RT		02.01.11

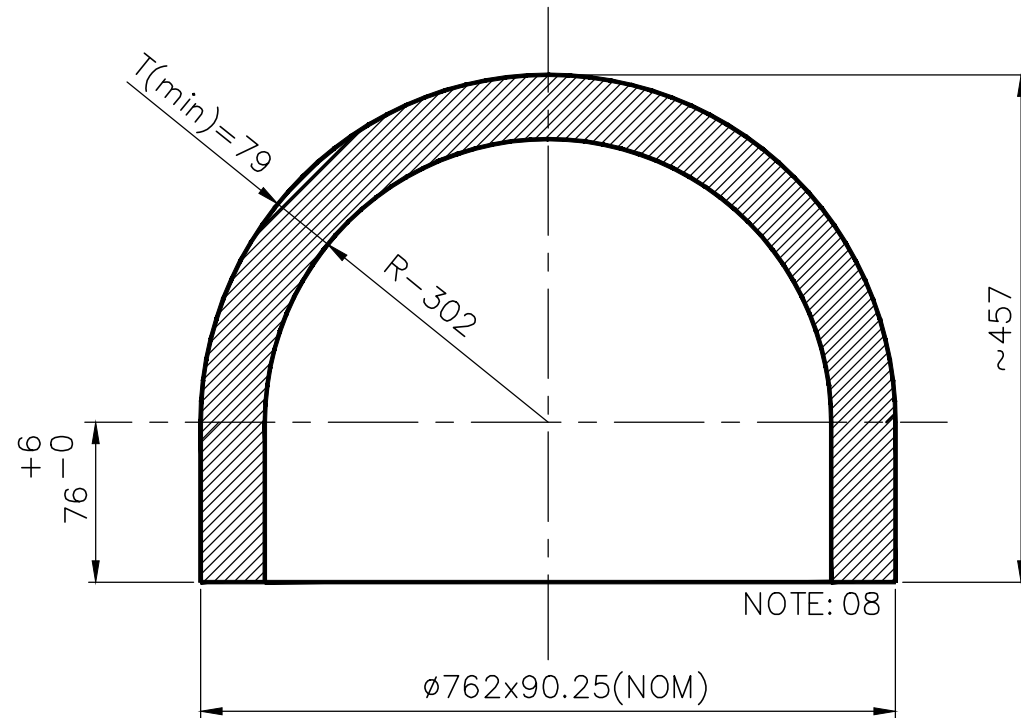
DEPT PP	ALL DIMENSIONS ARE IN MM	PROJECTION	SCALE NTS	WEIGHT (Kg) 639.000	REF TO ASSY / OLD DWG
CODE 121					
TITLE HEMISPHERICAL ENDCOVER D812.8X90(NOM)					DRAWING NO : 3-04-321-02749
					REV 01

3-04-323-02706
DRAWING NO.:

ALL DIMENSIONS ARE IN MM
FOR TOLERANCES OF UNTOLERANCED
DIMENSIONS DURING MANUFACTURE
REFER RELEVANT QCP / QP

NOTES:

01. DESIGN MANUFACTURE AND INSPECTION AS PER IBR.
02. FOR TOLERANCES REFER STD.DRG.NO: 4-03-000-00053.
03. ALL DIMENSIONS SHOWN ARE FINISHED DIMENSIONS.
04. NORMALISING AND TEMPERING IS TO BE DONE AFTER HOT FORMING.
05. NO THICKNESS GREATER THAN 152.4mm SHALL BE USED WITHOUT PRIOR BHEL APPROVAL.
06. FITTING SPECIFICATION : SA234 WP91
08. THE FORMED HEMISPHERICAL END COVER SHALL BE SUPPLIED WITH PLAIN END.



01

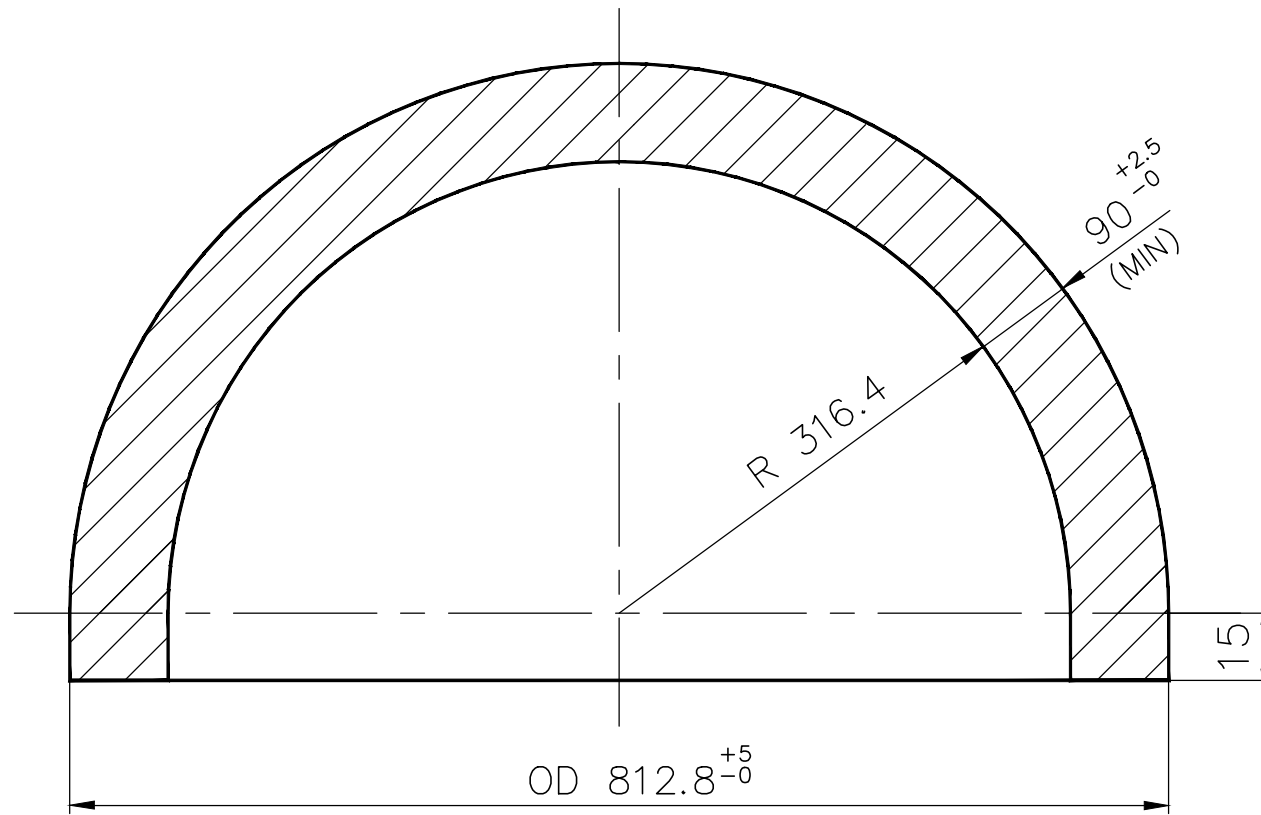
VARIANT NUMBER	ITEM NUMBER	DESCRIPTION	STD	DRAWING NUMBER	ITEM NO	MATERIAL CODE	A/C	UNIT	UNIT WEIGHT	GS
					VAR NO	MATERIAL SPECN		D1	QUANTITY	
		HS END COVER				SA 234 WP.91		A	500.000	

FITTING MATERIAL CODE: 920841940000

REV	DATE	ALTERED :K.S.
01	31.07.12	CHD & APPD: RAJA.K.
ZONE	NOTE -7 DELETED.	

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TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT								
	Bharat Heavy Electricals Ltd			DRN	NAME K.S	SIGNATURE	DATE	NO. OF VAR
	UNIT: HIGH PRESSURE BOILER PLANT			CHD	I.K.S		04.02.10	
	TIRUCHIRAPALLI - 620014			APPD	I.K.S		04.02.10	
DEPT	PP	SCALE	WEIGHT (Kg)	REF TO ASSY / OLD DWG		ITEM NO	No OF ITEMS	
CODE	121	NTS	500.00	F-33				
TITLE						CARD CODE	DRAWING NO :	REV
HEMISPHERICAL END COVER						U 01	3-04-323-02706	01
RAW FORMING D762X90.25(NOM)								



NOTES:

01. DESIGN MANUFACTURE AND INSPECTION AS PER IBR.
02. NORMALISING AND TEMPERING ARE TO BE DONE AFTER HOT FORMING.
03. THE RAW PLATE MATERIAL, BEFORE PURCHASE, SHALL BE HOT TENSILE TESTED AT A TEMPERATURE OF 446.1 °C.
04. FITTING SPECIFICATION : SA 234 WP12 CI1
05. RAW MATERIAL SPECIFICATION : SA 387 Gr12 CI2
06. ALL DIMENSIONS SHOWN ARE FINISHED DIMENSIONS.

REV	DATE	ALTERED :
01		CHD & APPD:
ZONE		

CAUTION: The information on this document is the property of BHARAT HEAVY ELECTRICALS LTD. It must not be used directly or indirectly in any way detrimental to the interest of the company.		TYPE OF PRODUCT OR NAME OF CUSTOMER/PROJECT					
		DEPT PP CODE 121		ALL DIMENSIONS ARE IN MM PROJECTION SCALE NTS		WEIGHT (Kg) 1200.000	
REF TO ASSY / OLD DWG		BHARAT HEAVY ELECTRICALS LTD UNIT: HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620014 355-055		DRN CHD APPD	NAME ISMAIL RAJA.K RT	SIGNATURE	DATE 01.12.14 02.12.14 03.12.14
TITLE CONNECTING SPHERE D812.8x90 (MIN)				DRAWING NO : 3-07-125-1124900		REV	

Revision Record:

Rev 09: New materials F23, F91 & F92 requirements added in Cl.1.0, Cl.2.0, and Cl.4.0 to Cl.6.0. CE marking certification clarity included in Cl.10.
 Rev 10: Cl 1:F6a Class 2 added, Code case corrected. Cl 2: Steel makers names removed and requirement for creep testing added as per IBR Reg 4,
 Cl 4: Tempering temperature and soaking time modified for SA 182 F91, F92 & F23. Cl 4 & 10: Photomicrograph requirement added for F91 & F92 forgings, Cl 2, 6 & 10:
 modified for SS, Cl 5: Bend test Clarified, Cl 6: Wet MPI added.
 Rev 11: Cl 2 Pt 3, 4, 5 modified. Cl 6 – Wet MPI for CS, AS added, Cl 10.1 – IBR Forms indicated
 Rev 12: Cl 1, 2, 4, 6 and 7 – requirements for grades SA 182 F1, SA 336 F1, F12, F22 Cl 3 and F91 added (for Neyveli Project). Creep test criteria in-line with BHEL R&D
 included. Cl 2 Pt 8 modified. Cl 6 Pt 1 – SA388 changed to ASTM A 388 based on ASME Sec II Ed 2013.
 Rev 13: Cl 2 Cl 4 Cl 10 Cl 12 modified

1. MATERIAL

Specification: ASME {Latest on date of Purchase Order (PO)}: (ASTM also applicable for non pressure parts / Valves)

Carbon Steel (CS) : SA 105, SA 350 LF 2
 Alloy Steel (AS) : SA 182 F6a Class 2, F6a Class 3, F12 Class 2, F22 Class 3, SA 182 F23 (Code case: 2199),
 SA 182 F91 & SA182 F92 (Code Case: 2179), SA 182 F1, SA 336 F1, SA 336 F12,
 SA 336 F22 Cl 3, SA 336 F9J
 Stainless Steel (SS) : SA 182 Gr. F 304, 304L, 316, 316L, 316H, 321, 321H, 347 & 347H;
 AISI 410 for TOA Gland and bushings.
 Additional Requirement : As listed below (supplementary to Specification)
 Size and Qty : As per Purchase order & Drawing.

2. CHEMICAL COMPOSITION & PROCESS

- 1) Melting: fully killed.
 Product analysis per heat: CS: C≤0.25%, AS: SA182 F23: Si: 0.25-0.50% & Cu: 0.25max
 SA182 F92: Si: 0.10-0.50%, Ni: 0.30 max & Cu:0.25% max
- 2) Raw material Steel for IBR forging items to be inspected at Mill & test certificate countersigned by IBR approved Authority, if the mill is not approved under IBR as well known steel maker.
- 3) Forging: to ensure uniformity of structure & strength with reduction ratio in area 4:1 min from ingot to final forging, close to final size & shape. Flow lines to be parallel to axis of openings. Forged Items ordered to this TDC shall be forged to the nearest shape before machining to final dimensions as per respective drawing.
- 4) Blooms / Billets used for forgings (Side Length, Dia)≥ 50mm shall be UT tested. For Acceptance Norm refer Cl.6.0. For finished bars this can be done at Final stage.
- 5) SS: All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity

3. DIMENSIONS AND TOLERANCES

Tolerances as per Drawing. Untoleranced dimensions for valve components as per VL:STDC:023(latest). Others as per drawing

4. HEAT TREATMENT(HT)

- 1) CS: SA 105: Normalised, SA 350 LF 2: Normalised at 880-900 °C & Tempered at 620-640 °C
 AS: Normalised and Tempered.
 For SA 182 F91, F92 & F23, SA336 F91 Normalising temperature : 1050-1080 deg C & Tempering temperature :730-780 deg C.
 AISI 410: Supply in Quenched & Tempered condition as below.
 Quenching at 955-1010°C in air or water or oil or Polymer. Soaking 30 mts/inch maximum thk. Tempering at 663°C.min. Soaking :60 mts/inch maximum thickness and air cool.
- 2) Photomicrograph test for F91 & F92 forgings - one per heat treatment lot per size and reported in test certificate.
Acceptance – The material shall be free from any micro fissures. Microstructure shall show lathe tempered martensite and also to be examined for grain growth. Photomicrograph with 500x (Min) magnification along with Photomicrograph report to be provided. The actual magnification and result of actual microstructure shall be certified/indicated.

5. MECHANICAL TESTS

- 1) Extent of test: for each size/heat/HT batch from sample product or identical test coupon.
- 2) Additional requirements for SA182 F23, F91 & F92:
 F91: Yield: (0.2% offset): Min 450MPa; Tensile: Min 630MPa, Max 850MPa; Hardness(HB): Min 191, Max 250
 F92: Tensile: Min 655MPa, Max 850MPa; Hardness(HB): Min 196, Max 250
 F23: Tensile: Min 510MPa, Max 850MPa; Hardness(HB): Min 150, Max 220
- 3) AISI 410: Hardness 197-235 BHN. No other mechanical test required.
Additional requirements of tests: (Other than AISI 410 Only)
- 4) **Bend test: Acceptance as per IBR**
 CS: Sample 19mm.Thick(t) x 25.4mm width to be bent 180 deg. around mandrel of radius 6.35 mm.
 AS, SS: Sample 19mm.Thick(t) x 25.4mm width to be bent 180 deg. Around mandrel of radius =1.5 x t
- 5) **Impact test for QCNR Valves & CRHNR Valves:** CS, AS and SS: 1 / HT batch. As per ASTM A 370, 2mm Charpy-U notch, at Room temperature. Acceptance: Avg of 3specimens: 36J, Single Min: 24J
- 6) **CE-marking items** Charpy- V impact test at 20 deg.C as per ASTM A 370,
 Acceptance : Avg : 40 joules, Min. single value: 27 joules.

6. NON DESTRUCTIVE TEST

- 1) Extent of test: for each product. Stage of test : After heat treatment.
- 2) UT: As per ASTM A388 - All finished forgings of dia/WT = / > 50mm. All Body & yoke of special class valves.
 All forgings of SA 182 F91, F92 & F23, SA 336 F91: Acceptance: ASME Sec.VIII Div. 2 Cl.3.3.4.
- 3) MPI : 100% : As per ASTM E 709. Linear Indications like cracks, folds & other injurious defects are unacceptable.
 Dry MPI/ Wet MPI : CS, AS (other than SA182 F91, F92, SA 336 F91) : all sizes
 Wet MPI : SA182 F91, F92, SA 336 F91: all sizes.
- 4) LPI: for SS: 100%: ASTM E165, No linear indications acceptable.
- 5) SS: Finished forgings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hr or 1 micro Sievert per hr.

7. WORKMANSHIP AND FINISH

Forged items to spec SA336 shall be machined in the inside surface as it is meant for steam application. Items to be proof machined as per drawing or shot blasted for CS/AS, Pickled & passivated as per ASTM A 380 for SS, & be free from scales & defects like laps, seams, folds, cracks, etc. Machined items (except SS) to be coated with a layer of transparent rust preventive before despatch.

8. REPAIR

Repairs by fusion welding are prohibited. Surface defects can be removed by mechanical means and defective areas smoothly dressed up with the adjacent surface. Minimum thickness after repair to meet drawing / Specification.

9. MARKING AND PACKING

Details of stamping on each item with low stress stamps: Heat number, Specification & grade, Maker's emblem/code & Inspection Authority's seal. Forgings to be properly packed and despatched to avoid damage during transit.

10. INSPECTION AND CERTIFICATION

10.1 The inspection and tests to be witnessed by an IBR approved inspecting agency, in case the Forge shop is not recognised as a "Well known Forger" under IBR. IBR Form III G countersigned by applicable inspection agency and Test certificate with following details, shall accompany the product (including proof machined). Well known Forger shall provide IBR Form IIF and Test certificate with following details, shall accompany the product (including proof machined):

1. Purchase Order No.(BHEL),TDC No. & Test certificate number.
2. Specification, Grade with applicable year of code, Heat Number, Drawing No.,Quantity & Size
3. Supplier of the steel used in making the finished product – Well known steel maker IBR Form IV & others Form IVA
4. Melting & forging process, Chemistry including incidental elements - Heat wise.
5. Heat treatment details of the material and test bars. For F91, F92 supplies – Photomicrograph at 500x resolution.
6. Mechanical test results, NDE test results with reference & acceptance standard.
7. Repair details if any, Certified copy of TC for starting material.
8. **For SS:** Measured Radioactivity levels shall be reported in the Mill Test Certificate. (Not to be recorded in IBR Form)

10.2 For CE-marking items the TCs with details specified above shall be submitted as per EN-10204 (latest)



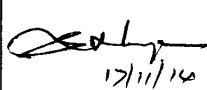


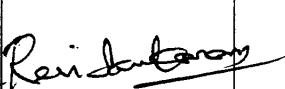
1. For pressure parts test certificates of type 3.1 or 3.2 is acceptable.
Type 3.1 – Suppliers shall have ISO 9001 certification certified by Notified Body recognized by European community and test certificate certified by suppliers authorized inspection representative.
Type 3.2 – Components inspected and test certificates certified by Notified Body recognized by European community.
2. For non pressure parts test certificates of type 2.2 is acceptable.
Type 2.2 – suppliers test certificates signed by suppliers authorized inspection representative with test results as required by TDC.

11. AUDIT CHECKS AT BHEL

BHEL reserves the right to carry out audit checks for chemistry, HT condition, mechanical test and NDT on representative test bars or job. Supplies found defective during check or subsequent processing at BHEL are liable for rejection.

12. END USE

Valve bodies, bonnets, discs, socket ends, body guides etc., Pressure part fittings in boilers & low, high temperature service like discs, socket weld tees, ells, weld neck flanges & stubs (except drum nozzles) meeting IBR, ASME Section I, ASME B16.34 and API. Non pressure part items in boilers and valves: For these, requirements on starting material, bend test and inspection by IBR are not required.

	 17/11/2014	 17/11/14	 17/11/14		
Haritha.C QA	Kalyanaraman.V QA	Selvarajan.S QA	Jayaraman.T MM	Raguraman.P MM	Revisankaran.U QA
Prepared	Reviewed			Approved	

Product: **FORGED & FORMED FITTINGS**Document No.: **TDC:0:423**Rev. No.: **07**Effective date: **10/11/2012**

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Revision record:**Rev: 00:** Supersedes TDC: 5:019 & can be used wherever the old TDC is specified.**Rev: 01:** New materials, IGCsT added. UT, Hardness requirement modified. LPI, MPI requirement added.**Rev: 02:** Flatness requirement added in clause no: 5.0**Rev: 03:** TDC for, Pipe Fittings for NTPC contracts (TDC 0 427). Pipe fittings indigenous supply(TDC 0 422) has been merged with this TDC and named as Butt Welded formed pipe fittings. Cl. 2.0 General removed, scope limited to IBR only and other clauses renumbered. Limits of carbon modified. Aligned with NTPC requirements.**Rev: 04:** Restriction in size below 2 in. removed based on Spares requirement.**Rev: 05:** Cl: 2.0, 3.0, Revised.**Rev: 06:** Product Heading changed. Cl 1.0 Scope and Raw material Sourcing added. Cl.2.0 & 3.0 merged and totally revised. Cl. 4.0, 5.0, 6.0 modified and renumbered.**Rev: 07:** Cl 1.0, 2.0 & 5.0 Modified for SS material.**1.0 MATERIAL SPECIFICATION:****SCOPE**

Fittings	:	Made by welding are prohibited.
ASME(Latest as on the Date of PO)	:	Carbon Steel (CS), Alloy Steel(AS): SA 234, Stainless Steel(SS): SA 403 ⁹
Additional Requirement	:	As listed below (supplementary to Specification)
Size Grade & Qty.	:	As per Purchase order (PO) / Drawing
Indigenous -		
Raw material for Alloy Steel & Stainless Steel	:	Shall be procured from IBR approved "Creep resistance steel makers"

2.0 MANUFACTURING & TESTING REQUIREMENTS:**2.1 Machined Fittings (Max size permitted 4") – Reducers, Couplings & End caps**

Starting material	Heat treatment	CS – Normalised AS – Normalised & Tempered SS – Solution Annealed
	Rolled or Forged Bars, Killed steel	NDE – UT ^d To be done after Heat treatment. For size above 50mm – to be done as per ASTM A 388 Acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4
Finished fitting (after machining)	HT	Not required
	NDE (for all sizes)	<ul style="list-style-type: none"> • MT (100%)- Procedure - As per ASTM E709. No linear indications are acceptable For WP91 Wet MPI shall be done • LPI – SS: Shall be done as per ASTM E165. No linear indications are acceptable. • SS: Finished fittings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hr or 1 micro Sievert per hr.
	Hardness	Base material Hardness for WP5 - 217 BHN max. WPB, WPC, WP11, WP12, WP22 – 197 BHN max. WP91 - 191-241 BHN – 100% to be checked
	Dimension	ASME B16.9 & ASME B16.11, As per Engineering Drawing -
	Bend Test (for IBR items)	Specimen: 19mm. Thickness (t) x 25.4mm width - cold bent 180 deg. over thin section without fracture, mandrel radius: CS :<=6.35 mm. AS, SS : <=1.5 times specimen thick.

2.2 Seamless Formed Fittings – Ells, Tees, Reducers, End cover (Dished end)

Starting material:																															
1) Tube & Pipe	NDE – UT ^d	Shall be done as per - ASTM E 213 with longitudinal notch of 5% wall thickness with max.1.5mm and min. 0.3mm. Actual measured notch depth to be specified in Test Certificate.																													
2) Forged blank (For end covers)	NDE – UT ^d	For size above 50mm UT shall be done as per - ASTM A 388 In acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4																													
3) Plate	NDE – UT ^d	For size above 10mm SA 578, Acceptance Level - B																													
Finished fitting (cold/hot forming)	Heat treatment after forming	Shall be done as per SA234/SA403. When Heat Treatment is required it shall be done as per the below table values: Stainless Steel: All grades - Solution Annealed: 1050-1100 Deg C Soaking time : ½ hr per inch with minimum 15 minutes																													
		<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Material</th> <th colspan="2">Heat Treatment Temp,C</th> <th colspan="2">Soaking time, hr/in</th> </tr> <tr> <th>Normalising</th> <th>Tempering</th> <th>Normalising</th> <th>Tempering</th> </tr> </thead> <tbody> <tr> <td>CS- WPB & WPC</td> <td>870-900</td> <td>-</td> <td>1/2</td> <td>-</td> </tr> <tr> <td>AS-WP11, WP12</td> <td>920-950</td> <td>655+- 15</td> <td>1/2</td> <td>1</td> </tr> <tr> <td>AS-WP5, WP22</td> <td>920-950</td> <td>695+- 15</td> <td>1/2</td> <td>1</td> </tr> <tr> <td>AS- WP91</td> <td>1040-1080</td> <td>746-774</td> <td>1/2</td> <td>1</td> </tr> </tbody> </table>	Material	Heat Treatment Temp,C		Soaking time, hr/in		Normalising	Tempering	Normalising	Tempering	CS- WPB & WPC	870-900	-	1/2	-	AS-WP11, WP12	920-950	655+- 15	1/2	1	AS-WP5, WP22	920-950	695+- 15	1/2	1	AS- WP91	1040-1080	746-774	1/2	1
		Material		Heat Treatment Temp,C		Soaking time, hr/in																									
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	AS-WP5, WP22	920-950	695+- 15	1/2	1																										
	AS- WP91	1040-1080	746-774	1/2	1																										
	Note																														
	1.Normalising shall be done for a minimum time of 30 min while tempering to be done for a minimum time of 60 min.																														
NDE (for all sizes) – Except for Pl. formed D.end	<ul style="list-style-type: none"> • MT (100%) - Shall be as per - ASTM E709 No linear indications are acceptable. For WP91 Wet MPI shall be done. • LPI – SS: Shall be done as per ASTM E165. No linear indications are acceptable. • SS: Finished fittings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hr or 1 micro Sievert per hr. 																														
NDE–for Plate formed D.end	For Plate Formed D.End – 100% MT as per - ASTM E709 on both inner and outer surfaces of Knuckle radius and weld ends. No linear indications are acceptable.																														
NDE – UT ^d For OD > or=219mm & W.T >or= 6mm	If made from Pipe & Tube – Shall be done as per - ASTM E 213 with longitudinal notch of 5% wall thickness with max.1.5mm and min. 0.3mm. Actual measured notch depth to be specified in Test Certificate. If made from Forging Shall be as per - ASTM A 388 In acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4 If made form Plate shall be as per A578 Level-B																														
Hardness	Base material Hardness for WP5 – 217 BHN max. WPB, WPC, WP11, WP12, WP22 – 197 BHN max. WP91 - 191-241 BHN – 100% to be checked																														
Dimension	ASME B16.9 & ASME B16.11, As per Engineering drawing.																														
Bend Test (if starting material is forged blank) (for IBR items)	Specimen : 25.4 mm x 19 mm thick - cold bent 180 deg. over thin section without fracture, internal radius of bend: CS : <=6.35 mm. AS, SS: <=1.5 times specimen thick.																														

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2.3 Forged Fittings – Ells, Tees, Reducers, Couplings, and Flanges & End cover (Dished End)

Shall be forged to the shape with a minimum forge reduction ratio of 1:4. Fitting shall not be machined from a forged block.

Starting material: Rolled or forged Bars, blooms, billets and Killed steel	NDE – UT ^d	To be done for diameter or thickness above 50mm Procedure - As per ASTM A388 In acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4																													
After forging (cold/hot forging)	Heat treatment	<p>Shall be done as per SA234/SA403. When Heat Treatment is required it shall be done as per the below table values:</p> <table border="1"> <thead> <tr> <th rowspan="2">Material</th> <th colspan="2">Heat Treatment Temp,C</th> <th colspan="2">Soaking time, hr/in</th> </tr> <tr> <th>Normalising</th> <th>Tempering</th> <th>Normalising</th> <th>Tempering</th> </tr> </thead> <tbody> <tr> <td>CS- WPB & WPC</td> <td>870-900</td> <td>-</td> <td>1/2</td> <td>-</td> </tr> <tr> <td>AS-WP11, WP12</td> <td>920-950</td> <td>655+- 15</td> <td>1/2</td> <td>1</td> </tr> <tr> <td>AS-WP5, WP22</td> <td>920-950</td> <td>695+- 15</td> <td>1/2</td> <td>1</td> </tr> <tr> <td>AS-WP91</td> <td>1040-1080</td> <td>746-774</td> <td>1/2</td> <td>1</td> </tr> </tbody> </table> <p>Stainless Steel: All grades - Solution Annealed: 1050-1100 Deg C Soaking time: ½ hr per inch with minimum 15 minutes.</p> <p>Note 1. Normalising shall be done for a minimum time of 30 min while tempering to be done for a minimum time of 60 min.</p>	Material	Heat Treatment Temp,C		Soaking time, hr/in		Normalising	Tempering	Normalising	Tempering	CS- WPB & WPC	870-900	-	1/2	-	AS-WP11, WP12	920-950	655+- 15	1/2	1	AS-WP5, WP22	920-950	695+- 15	1/2	1	AS-WP91	1040-1080	746-774	1/2	1
Material	Heat Treatment Temp,C			Soaking time, hr/in																											
	Normalising	Tempering	Normalising	Tempering																											
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AS-WP5, WP22	920-950	695+- 15	1/2	1																											
AS-WP91	1040-1080	746-774	1/2	1																											
Finished fitting	NDE – UT ^d For OD > or = 219mm	UT shall be done as per - ASTM A388 In Acceptance to - ASME Sec.VIII Div.2 Cl.3.3.4																													
	NDE (for all sizes)	<ul style="list-style-type: none"> MT-(100%) Shall be done as per ASTM E709. No linear indications are acceptable. For WP91 Wet MPI shall be done. LPI – SS: Shall be done as per ASTM E165. No linear indications are acceptable. SS: Finished fittings shall be checked for radioactive contamination and reported. Survey meter shall be used to measure at 5cm near the surface. Acceptance limits: Shall be less than 0.1 milli Rontgen (MR) per hr or 1 micro Sievert per hr. 																													
	Hardness	Base material Hardness for WP5 & WP9 – 217 BHN max. WPB, WPC, WP11, WP12, WP22 – 197 BHN max. WP91 - 191-241 BHN – 100% to be checked																													
	Dimension	ASME B16.5 & ASME B16.11, As per engineering drawing.																													
	Bend Test (for IBR items)	Specimen: 19mm. Thickness (t) x 25.4mm width - cold bent 180 deg. over thin section without fracture, mandrel radius: CS : <=6.35 mm. AS, SS : <=1.5 times specimen thick.																													

General requirements:

- Product analysis as per S50 of ASTM A960 is required.
- Carbon < or = 0.25% for WPB (all thickness) and WPC (thickness < or = 20mm)
- Carbon < or = 0.30% for WPC (thickness > 20mm)
- If UT not done on the starting material, the same shall be done by the fitting manufactures before forming / fabrication.
- Mechanical Testing – Test samples shall be tested in the Heat treatment of fitting delivered condition
- Pipe made from plate as a starting material and long seam welded should not be used.
- All raw materials used in steel making including incoming scrap shall be checked by supplier to ensure freedom from radioactivity. (Applicable for SS material only)

3.0 REPAIRS AND FINISH:

The products shall be free from injurious defects like crack, seam etc. with workman like finish. Repairs involving fusion welding is prohibited. Surface defects can be removed by mechanical means and the defective areas shall be merged with adjacent surface. Minimum thickness after repair shall meet the drawing / specification requirements. Flatness on curved surfaces of fittings shall be limited to 6% of nominal OD. Thickness : Outer Diameter and Transition : Variation shall be merged smooth to min 1:4 taper.

Product: **FORGED & FORMED FITTINGS**Document No.: **TDC:0:423**Rev. No.: **07**Effective date: **10/11/2012**

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4.0 MARKING, PRESERVATION AND PACKING:

The following details to be necessarily hot stamped 1. Heat number, 2. Inspecting Authority Seal 3. Specification Grade and Size, 4. Company Seal and "B16"(for ANSI fittings).

The rest to be marked as per Specification.

Additionally The following to be painted :

for OD > 108mm : PO No., Sl. No., Specification, "BHEL-Tiruchirappalli", Drawing.No. & Weight

for OD <= 108mm : Sl. No., Specification

CS & AS fittings to be rust preventive coated after shot blasting inside & out side & packed to avoid damage.

SS fittings to be surface treated (Pickling, Passivation) as per ASTM A380 both inside and outside.

5.0 INSPECTION AND CERTIFICATION:

a. Products must be inspected at works and the test certificates must be countersigned by the Inspecting Authority as indicated below:

Imported items: Inspecting Authority approved by IBR for the country of origin. (to be concurred by BHEL before PO) with Form III-C as per-IBR and MTC as given below.

Indigenously supplied IBR items:

a) Boiler Inspectorate/Directorate of Boilers of respective State if supplier is not approved under IBR with Form III-C as per IBR and Manufacturers Test certificate as given below.

b) Form III-C as per IBR certified by the Manufacturer if approved under IBR and Manufacturers Test certificate (MTC) as given below.

Indigenously supplied non IBR items: Manufacturers Test certificate as given below.

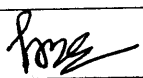

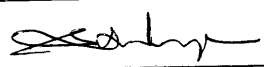
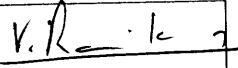
1. Purchase Order No.(BHEL),TDC No. & Test certificate number
2. Specification, Grade with applicable year of code, Heat Number, Drawing No.,Quantity & Size
3. Supplier of the steel used in making the finished product
4. Forming process, Chemistry including incidental elements - Heat wise.
5. Heat treatment details: temperature, soaking time, cooling medium (for quenching).
6. Mechanical test results, Hardness, NDE test results with reference & acceptance standard.
7. Detailed NDE reports for MT, LPI and UT shall be submitted along with MTC.
8. Micro for WP91 in final Heat treated condition of fittings.
9. PMI certification for all Alloy steels fittings.
10. Print of the stamp of Inspecting Authority, which is used in the fitting.
11. Dimensional reports for each product
12. Repair details if any.
13. Certified copy of TC for starting material.
14. Guarantee certificate for retainability of hydrostatic test pressure corresponding to that of matching pipe of equivalent material or Hydro static test report as applicable.

b. For CE-marking items the TCs with details specified above shall be submitted as per EN-10204 (latest)

1. For pressure parts test certificates of type 3.1 or 3.2 is acceptable.
Type 3.1 – Suppliers shall have ISO 9001 certification certified by Notified Body recognized by European community and test certificate certified by suppliers authorized inspection representative.
Type 3.2 – Components inspected and test certificates certified by Notified Body recognized by European community.

2. For non pressure parts test certificates of type 2.2 is acceptable.
Type 2.2 – suppliers test certificates signed by suppliers authorized inspection representative with test results as required by TDC.

c. For SS: Measured Radioactivity levels at 5cm from the surface of the fitting shall be reported in the Mill Test Certificate. (Not to be recorded in IBR Form)

			
C.Haritha	V.Kalyanaraman	Selvarajan.S	V.Ravikumar
Prepared By	Reviewed by		Approved By

Revision record: Rev 00 14/03/11: Fresh issue

Rev 01 03/04/11: Cl 1: CS grade modified in line with drawing, TDC for Alloy steel starting material clarified, Cl 2, 3, 4, 5: the term 'plates' modified by 'coupon/ plates', Cl 5: High temperature test values modified in line with ASME Sec II 2011a Addenda, Cl 10: Certification modified in line with SA234 Cl 17.

Rev 02: 03/04/13: Date of revision corrected – typographical error.

Rev 03: 01/12/14 – Cl 1 – Raw material TDC numbers removed and requirements added. CL.3,4 Temperature modified. Cl 5 – High temperature tensile test for AS modified. Bend test added. CL.7 Circularity tolerance added.

1. MATERIAL SPECIFICATION:

ASME (Latest as on PO Date): Carbon Steel (CS): SA299, Alloy Steel (AS): SA 234 WP12 CL.1

Additional Requirement:

Raw Material: SA299 (CS), SA 387 Gr 12 Cl 2 (AS) - All plates are of Fully Killed steel. Plates shall be of Vacuum Degassed (S1 of SA20).

Final rolling: lengthwise. Plate thickness (t) > 80mm to be made only from ingots. Plate of t <= 80mm, can be made from continuous cast slabs. Reduction ratio in thickness from slab/ingot to plate shall be 3:1. Sufficient 'Top of Ingot' to be discarded to ensure plates are free of segregation. After top discard the increase in Carbon content at the top-mid, width-mid thickness of the plate shall not exceed 20% of the reported ladle analysis value. This value shall be reported in Test Certificate.

Ladle analysis: 1 sample per cast, Product analysis: min.1 sample per plate as rolled. For CS - Max. Carbon: 0.28%, Max. Al: 0.05%, Carbon Equivalent for Carbon Steel: As per S20 of SA20.

CS: plates shall be Normalized, AS: Plates shall be normalized and tempered. UT as per SA578 with acceptance criterion Level B. Final certification in IBR Form IV, duly signed by IBR approved Inspection authority for that region/Boiler directorate (If not well known plate maker).

Material, Size and Qty: As per Purchase order (PO) / Drawing

2. FORMING:

Process: Hot Forming with Dies and tools clean of loose scale and sheet particles. The process details and drawing shall be submitted to BHEL for approval. Test coupon/plate: For each Product: size: 300mm X 300mm. (or, use extra portion of skirt). The test coupon/plate to accompany the product during all stages of heating and heat treatments of the product.

3. POST FORMING HEAT TREATMENT (HT): along with test coupon/plates after hot forming

Carbon Steel (CS): Normalize at 870-900°C, 0.5 hr./inch, Air cool.

Alloy Steel (AS): Normalize at 920-950°C, 0.5 hr./inch, Air cool & tempering at 650-680°C.,1hr./inch of thk.

4. SIMULATION HEAT TREATMENT for test coupon/plates:

For Carbon Steel: Stress Relieving at 615+/-10 deg.C, 3 hr./inch t, furnace cool to 400 deg.C.

For Alloy Steel : Stress Relieving at 665+/-15 deg.C, 3 hr./inch t, furnace cool to 400 deg.C.

Rate of heating /Rate of cooling: < 220 / t deg.C/hr (t in inch), but need not be slower than 55 deg.C/hr.

5. MECHANICAL TESTS: on Simulated Heat Treated test coupon/plates

Extent of test: One Per size/ per heat/ per HT batch.

Orientation of Specimen :Transverse to rolling direction.

(1)Tensile test: As per the specification (2) Hardness(max.):197 BHN

(3) High temperature tensile test as per S7 of SA20 – CS: Yield strength at 400°C: 19.10Kg/Sq.mm (Min).

AS: Yield strength at 500°C: 15.0 Kg/Sq.mm (Min)

(4)Bend Test: Angle of Bend: 180 Deg. Diameter of the mandrel: CS: 3 X Thickness of the Plate as rolled

AS: 2 x Thickness of the plate as rolled

6. NON DESTRUCTIVE TEST:

MPI: Both inside and outside surface of the Dished ends as per Appendix - 6 of ASME Sec.VIII Div.I.

7. DIMENSIONAL TEST:

Dimensions and Tolerances: As per the Drawing indicated in the Purchase Order.

Circularity: Difference between the Max. and Min. Inside diameter at skirt portion shall not exceed 1% of nominal diameter.

Profile Departure: The inner surface of the dished ends shall not deviate outwards from the specified shape by more than 1.25% of the Nominal inside Diameter and inwards by 5/8 % of nominal inside diameter specified. This shall be measured using a profile gauge having length not less than 1/4th of the internal Diameter of the Dished End.

8. FINISH AND REPAIRS:

The products shall be free from injurious defects and shall have a workman like finish. Repairs involving fusion welding is prohibited. Surface defects can be removed by mechanical means and the defective areas shall be merged with adjacent surface. Minimum thickness after merging shall meet the drawing / Specification requirements. Details shall be recorded.

9. MARKING, PRESERVATION AND PACKING:

Details to be stamped with low stress stamps sufficiently away from the knuckle radius on the Outside surface of each product.

1. Specification and grade 2.Melt number 3.Maker's emblem/code 4.Inspecting Authority's seal.

Details to be painted on the product: PO No., "BHEL-Tiruchirappalli", Drawing No. & Weight. Products to be applied with 1 coat rust preventive & dispatched suitably to avoid damage in transit.

10. INSPECTION AND CERTIFICATION:

Products must be inspected at works by the Inspecting Authority approved by Indian Boiler Regulation. Test certificate (In English only) for each product as per IBR form III-C countersigned by the Inspecting Authority with the following details shall accompanied.

1. Purchase Order No. (BHEL), TDC No. & Test certificate number, Specification and Grade with applicable Year of code
2. Copy of the raw material Test Certificate
3. Quantity & Drawing No, Heat Number, Forming process, Seamless or welded.
4. Chemistry including incidental elements - Ladle and Product analysis. When the amount of an element is less than 0.02% the analysis for that element may also be reported.
5. HT details of material & test coupons: temperature, soaking time, ROH/ROC, medium etc.
6. Mechanical test results, Hardness including High temperature test results. Detailed NDE test results with reference & acceptance standard.
7. Print of the stamp of Inspecting Officer, which is used on the plate.
8. Repair details, if any, Dimensional reports for each product.
9. In the MTC a clause for certificate of compliance shall be added stating that – “The fitting was manufactured, sample tested and inspected in accordance with the specification and was found to meet the requirements.”

11. AUDIT CHECKS AT BHEL :

BHEL reserves the right to reject any item found to be not meeting the requirements during check tests, or during subsequent processing at BHEL.

Haritha.C/QA	Kalyanaraman.V/QA	Selvarajan.S/QA	Jayaraman.T/ MM	Revisankaran.U/QA
Prepared by	Reviewed by		Approved by	

BHARAT HEAVY ELECTRICALS LIMITED
MM / PURCHASE - C&F
BHEL, Trichy – 620014

Annexure 2

Enquiry Terms and Conditions

Note: This annexure has to be mandatorily filled in and signed by the manufacturer (or) mill and submitted along with Technical bid

S.No.	BHEL Reuirements	Supplier Comments (Acceptance or otherwise for each point to be given)
1	<p><u>Material Specification:</u> Supply of Dished Ends shall be strictly as per the material specification mentioned against each item of the enquiry.</p>	
2	<p><u>Technical Conditions:</u></p> <ol style="list-style-type: none"> 1. Supply of Dished End shall be strictly as per drawings mentioned against each item of the enquiry. 2. Supply shall be as per TDC 423/07 for the following items: <ol style="list-style-type: none"> i. 920842250000 ii. 920841930000 iii. 920841940000 3. Supply shall be as per TDC 432/03 for the following items: <ol style="list-style-type: none"> i. 920840110000 ii. 920849750000 4. Supply shall be as per TDC 404/13 for the following items: <ol style="list-style-type: none"> i. 920849550000 5. Inspection by authorized inspection agency attached (Annexure 2). 6. TC in FORM IIIC, works TC, Raw Material TC, UT report, MPI report and other test certificates as called in TDC 437/00 shall be sent along with supply. 	
3	<p>Payment Term (Indigenous)</p> <ol style="list-style-type: none"> 1. Payment term is 100% direct payment after 45 days from the date of receipt and acceptance of materials. Any deviation in the above payment term will attract loading as mentioned below. <p>“Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.</p> <ol style="list-style-type: none"> 2. Offers of indigenous Suppliers with payment terms as LC / Advance Payment are liable for rejection. 3. Payment through Bank is not preferred. In case of Payment through Bank is opted by Supplier, BHEL prefers documents submission through bank with copy of LR and door delivery of Goods to Site/Stores with Consignee copy attached. In this case Loading will be 3% on the offered value. 	
4	<p>Payment Term (Imports)</p> <ol style="list-style-type: none"> 1. BHEL Payment term is 100% payment on CAD basis after 45 days from the date of receipt of documents, specified in PO, at BHEL bank. Respective bank charges to respective account. <p>Any deviation in the above payment term will attract loading as mentioned below.</p>	

	<p>“Base rate of SBI (as applicable on the date of bid opening. Techno-commercial bid opening in case of two part bids) + 6% shall be considered for loading for the period of relaxation sought by bidders.</p> <p>2. In the case of Usance LCs the loading will be considered @ 1.5% on the offered Value.</p> <p>3. For LC at sight the loading will be considered @ 3.5% on the offered Value.</p> <p>4. Normally CAD at sight and Confirmed LCs are liable for rejection. However, if CAD at sight is accepted by BHEL, a loading of 5% will be done on the offered Value.</p>	
5	<p>Liquidated Damages / Penalty</p> <p>1. For staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of the delay or part thereof subject to a maximum of 10% of the total order value.</p> <p>2. Any deviation from the above LD clause, loading will be applied to the extent to which it is not agreed by the bidder (at offered value).</p> <p>3. If LD is not accepted on total order value a loading of 10% on the offered value will be done.</p> <p>4. For FOB contract LD will be calculated form the date of TPI signature.</p>	
6	<p>Bank Guarantee:</p> <p>The Bidder, in the event of an order, should furnish a bank Guarantee from BHEL's consortium banks (List attached) or counter-guaranty by vendor's bank to BHEL's consortium banks, at no extra cost to BHEL, in a proforma prescribed by BHEL, provided along with the order, for an amount equivalent to 10% (Ten percent) of the value of the contract. The BG shall be valid for period of 18 months from the date of last shipment or 12 months from the date of receipt / acceptance / at BHEL, TRICHY whichever is later, with a claim period of two months.</p>	
7	<p>Risk Purchase:</p> <p>BHEL at its option will be entitled to terminate the contract and to purchase elsewhere at the risk and cost of the seller either the whole of the goods or any part which the supplier has failed to deliver or despatch within the time stipulated as aforesaid or if the same were not available, the best and the nearest available substitute thereof. The supplier shall be liable for any loss which BHEL may sustain by reason of such risk purchases in addition to LD at the maximum rate mentioned in the LD clause above.</p>	
8	<p>BHEL will consider the ranking after the loading is applied as referred above wherever deviations are observed.</p>	
9	<p>Fixed Price:</p> <p>Prices quoted by the bidder shall be fixed and not subject to any escalation whatsoever during the period of bid validity and execution of the Purchase Order. A bid submitted with an adjustable price will be liable for rejection. Prices shall be written in words and figures. In the event of any discrepancy with regard to</p>	

	<p>total price and unit price whichever is less shall be considered correct. Unit rates quoted should include all the charges like third party inspection charges, packing & Forwarding etc. If the charges are shown separately, the same shall be in % of basic unit rate. No Lump sum charges shall be quoted.</p>	
10	<p>Bid Currency:</p> <p>1. Indian bidders should submit the prices only in Indian Rupees. Foreign bidders may submit their bid in their preferred currency.</p> <p>2. For evaluation, Exchange rate (TT selling Rate of SBI) as on Techno-Commercial bid opening date shall be considered.</p> <p>3. Suppliers to quote their rates on FOB/Load Port basis only for the below ports clearly mentioning their preferred type of Loading (Containerised Cargo or Break Bulk cargo).</p> <p>* The available load ports for FCL (Full Container Load) Cargo in Freightling Contract are Antwerp, Hamburg, Genoa, Rotterdam, Bilbao, Gothenberg, Felixstowe, St.Petersberg, Busan, Dalian, Shanghai, Kobe, Osaka, Yokohama.</p> <p>* The available load ports for LCL (Less than Container Load) Cargo in Freightling Contract are Antwerp, Hamburg, Genoa, Rotterdam, Bilbao, Gothenberg, Felixstowe, Thamesport, Tilbury, Le Harve, St.Petersberg, Busan, Masan, Dalian, Shanghai, Tianjin, Kobe, Osaka, Yokohama, Singapore, Durban,</p> <p>* The available load ports for BB (Break Bulk) Cargo in Freightling Contract are Antwerp, Hamburg, Genoa.</p> <p>4. For FOB contract delivery period mentioned shall be the date of TPI signature.</p>	
11	<p>Validity:</p> <p>1. The offers shall be kept open for acceptance for 90 days from the date of Tender opening. Once the tenders are submitted, rates cannot be changed on any grounds.</p> <p>2. BHEL reserves the right to negotiate L1 rate or re float the tender opened if L1 price is not the lowest acceptable price to them inter-alia other reasons.</p> <p>3. Any other conditions which might have been quoted by the seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in by purchaser will not be applicable to the contract.</p>	
12	<p>1. Bidders shall submit the OFFER in English language (a single envelope containing two inner envelopes) as indicated below:</p> <p>Envelope 1: This sealed envelope should contain</p> <p>(a) technical bid</p> <p>(b) un-priced commercial bid (copy of the Priced Bid without the price details)</p> <p>This envelope should be clearly marked "Part I – Technical and Un-priced commercial bid, indicating Enquiry No., Due Date, Address & Reference of the Bidder.</p>	

Envelope II: This sealed envelope should contain price details. This envelope should be clearly marked "Part II - Price bid", indicating Enquiry No., Due Date, Address & Reference of the Bidder.

2. The OFFER, sealed and Super scribed as "Parts I & II inside" indicating Enquiry No., Due Date, Address & Reference of the Bidder should reach this office on or before the due date by 14:00 Hrs (IST). OFFERS RECEIVED AFTER 14:00 Hrs (IST) WILL NOT BE CONSIDERED FOR EVALUATION.

The OFFER to be addressed to:

Sr. MANAGER / PURCHASE - C&F / MM / RM
4th Floor - Building 24
BHARAT HEAVY ELECTRICALS LIMITED
HIGH PRESSURE BOILER PLANT TIRUCHIRAPALLI - 620 014
TAMIL NADU, INDIA.

Note: Bidders are requested to submit their offers only through sealed bids.

3. Bidders may submit their bids through email/fax etc.

4. BHEL prefers the manufacturers to quote directly. In case this is not possible and the offer is being submitted by an Indian agent, the following details are to be furnished along with the offer:

a. The letter from their Principal authorising the Indian agent to submit the offer on their Principal's behalf. In case the Indian agent submits offer on their own letter head then a covering letter (in original) from the Principal should be enclosed, clearly mentioning that they are bound by the offer submitted by the Indian agent on their behalf.

b. Precise relationship between foreign suppliers and their Indian agents and their mutual interest in business, should be clearly spelt out.

c. Any payment, which the agent receives in India or abroad, from the foreign supplier, whether as a commission or as a general retainer fee is to be mentioned in the offer.

d. All services to be rendered by the agent, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier and the Indian agent.

e. The amount of agency commission agreed to between the foreign principal and the Indian agent should be specifically disclosed and the agency commission will be paid in Indian Rupees only on satisfactory completion of the contract.

f. Copy of current agency agreement is to be enclosed without which the offer is liable for rejection.

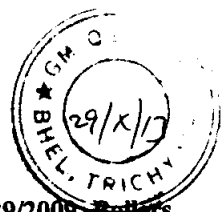
The correspondence between the bidder and BHEL through email is considered to be valid document legally though not signed. It is treated as valid confirmations made on behalf of the respective company and comes under the legal ambit of the business transaction and hence binding on both the parties.

Bidders participating in the tender should declare in their technical bid whether they have been black-listed / kept on hold / given Business holiday for a specified period by any Public Sector Undertaking or Government Departments. The reasons for such action with details and the current status of such hold shall be clearly furnished to BHEL. If no such details are mentioned in the offer, it will be construed that the bidder is not under any such hold. However, at a later date if it

<p>comes to the notice of BHEL about any such hold under enforcement, BHEL reserves the right to reject the offer at any point of time and also under any stage of the finalisation of the tender. Such bidders will not be permitted to participate in the further tender proceedings and will be communicated suitably.</p>	
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<p>Any other conditions which might have been quoted by the seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in by purchaser will not be applicable to the contract.</p>	
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Fax : 011-2306 2626



संख्या /No. 20/29/2009-Boilers

भारत सरकार

वाणिज्य और उद्योग मंत्रालय
(औद्योगिक नीति एवं संवर्धन विभाग)
उद्योग भवन, नई दिल्ली - 110107

GOVERNMENT OF INDIA
MINISTRY OF COMMERCE AND INDUSTRY
(DEPT. OF INDUSTRIAL POLICY & PROMOTION)

UDYOG BHAWAN, NEW DELHI-110107,
दिनांक/ Dated, the 8th October, 2013

To

1. All the members of the Central Boilers Board
2. All the Inspecting Authorities

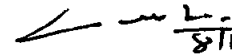
Subject: List of recognised Inspecting/Competent Authorities, Well Known Steel Makers, Foundries/Forgings units, Tube/Pipe Makers, Material Testing Laboratories and Remnant Life Assessment Organizations under Indian Boiler Regulations as on 30th September, 2013.

Sir,

I am to forward herewith a copy each of the list of recognised Inspecting/Competent Authorities, Well Known Steel Makers, Foundries/Forgings units, Tube/Pipe Makers, Material Testing Laboratories and Remnant Life Assessment Organizations under Indian Boiler Regulations, 1950, as on 30th September, 2013 for your reference and record.

Thanking you,

Yours faithfully,


8/11/13-111

(S. K. Jain)

Development Officer &
Assistant Secretary, Central Boilers Board
Tel.No.011-23063166

Encl: "As above"

uploaded in @ home

for
5/12/13

(As on 30/09/2013)

INSPECTING AUTHORITIES

<u>NAME OF THE AUTHORITY</u>	<u>AREA OF OPERATION</u>
1. Director of Boilers, Andhra Pradesh	Andhra Pradesh
2. Chief Inspector of Boilers, Arunachal Pradesh	Arunachal Pradesh
3. Chief Inspector of Boilers Assam	Assam
4. Chief Inspector of Boilers Bihar	Bihar
5. Chief Inspector of Boilers Chhattisgarh	Chhattisgarh
6. Chief Inspector of Boilers, Delhi	N.C.T.D.
7. Chief Inspector of Boilers, Goa.	Goa
8. Director of Boilers, Gujarat.	Gujarat, Daman & Diu and Dadra & Nagar Haveli
9. Chief Inspector of Boilers, Haryana.	Haryana & Chandigarh
10. Chief Inspector of Boilers, Himachal Pradesh.	Himachal Pradesh
11. Chief Inspector of Boilers,, Jharkhand.	Jharkhand
12. Director of Boilers, Karnataka.	Karnataka
13. Director of Boilers, Kerala.	Kerala
14. Director of Boilers, Madhya Pradesh.	Madhya Pradesh
15. Director of Boilers, Maharashtra.	Maharashtra
16. Chief Inspector of Boilers, Meghalaya	Meghalaya
17. Chief Inspector of Boilers, Manipur	Manipur

- | | |
|--|---|
| 18. Chief Inspector of Boilers,
Mizoram | Mizoram |
| 19. Chief Inspector of Boilers,
Nagaland | Nagaland |
| 20. Director of Boilers,
Orissa | Orissa |
| 21. Director of Boilers,
Punjab | Punjab |
| 22. Chief Inspector of Boilers,
Labour Department,
Government of Puducherry,
Puducherry | Puducherry |
| 23. Chief Inspector of Boilers,
Rajasthan. | Rajasthan |
| 24. Director of Boilers
Tamil Nadu | Tamil Nadu |
| 25. Chief Inspector of Boilers,
Tripura | Tripura |
| 26. Director of Boilers,
Uttar Pradesh | Uttar Pradesh |
| 27. Deputy Director of Factories & Boilers
Uttarakhand | Uttarakhand |
| 28. Chief Inspector of Boilers,
West Bengal | West Bengal |
| 29. M/s. Lloyd's Register Asia
63-64, Kalpataru Square, 6 th Floor,
Kondivita Lane, Off. Andheri-Kurla Road,
Mumbai-400 059 | Tamil Nadu, Maharashtra
Karnataka, Gujarat, Haryana,
Himachal Pradesh, Punjab
& Andhra Pradesh |
| 30. M/s Bureau Veritas (India) Private Limited,
Marwah Centre, 6 th Floor,
Opp. Ansa Inds. Estate, K. Marwah Marg,
Off. Saki-Vihar Road, Andheri (East),
Mumbai-400 072 | Chhattisgarh, Gujarat
Maharashtra , Odisha &
Tamil Nadu |
| 31. M/s. TUV Nord Systems GmbH Co.KG.
Langemarckstr 20
451141 Essen
GERMANY. | Europe, Brazil, China, Korea
and Thailand |

- | | | |
|-----|--|--|
| 32. | M/s RSA
(Formerly Royal & Sun Alliance plc)
17 York Street,
Manchester, M2 3RS,
United Kingdom | Europe |
| 33. | M/s. Japan Inspection Company Limited,
No.10-7, 1-Chome, hatchobori, Chou-ku,
Tokyo, 104-0032, Japan | All countries in Asia except
India |
| 34. | M/s. S.G.S. Korea Company Limited,
Industrial Division,
647-2, Sinpyeong-dong,
Saha-gu, Busan,
KOREA (604-030). | Korea & Japan |
| 35. | M/s Bureau Veritas,
67-71, Boulevard du Chateau,
92200 Neuilly-sur-Seine,
FRANCE | All countries except India. |
| 36. | M/s. Lloyds Register Verification Ltd.,
71, Fenchurch Street,
London EC 3M, U.K. | All countries except India. |
| 37. | M/s. Velosi Certification Bureau Ltd.,
Unit 1 Woodside Business Park,
Whitley Wood Lane,
Reading, Berkshire, RG2 8LW
United Kingdom | Europe, Middle East
Countries, China, Malaysia
Singapore & USA |
| 38. | M/s TUV Rheinland AG
(Formerly: M/s TUV Rheinland Brandenburg P falz e.V.),
Am Grauen stein, D-51105 Klon,
Germany | Europe , Japan, China &
Korea |
| 39. | M/s OOO "TekhnoLogicheskieEnergostime"
1. Kalinia St. Belgorod, 308001
Russia | Russia, China, Ukraine, USA
& Germany |
| 40. | M/s Engineering Bureau Franke
International,
55, Amurskaya St.,
Dnepropetrovsk
49108, Ukraine | Ukraine, Russia, Belarus, China ,
Uzbekistan, Poland, Belgium, Romania,
& Czech Republic |
| 41. | M/s. ARISE Boiler Inspection &
Insurance Company Risk Retention Group,
Grand Bay 1, 7000 South Edgerton Road,
Suite 100, Breeksville,
OH 44141 USA | USA & Canada |

List of Consortium Bank

Nationalised Bank		Nationalised Bank	
1	Allahabad bank	19	Vijaya Bank
2	Andhra bank		Public Sector Banks
3	Bank of Baroda	20	IDBI
4	Canara Bank		Foreign bank
5	Corporation bank	21	CITI Bank N.A
6	Central bank	22	Deutsche Bank AG
7	Indian Bank	23	The Hongkong and Shanghai Banking Corporation Limited
8	Indian Oversea Bank	24	Standard Chartered Bank
9	Oriental bank of Commerce	25	The Royal Bank of Scotland N.V.
10	Punjab National Bank	26	J P Morgan
11	Punjab & Sindh Bank		Private bank
12	State Bank of India	27	Axis Bank
13	State Bank of Hyderabad	28	The Federal Bank Limited
14	Syndicate Bank	29	HDFC
15	State Bank of Travancore	30	Kotak Mahindra Bank
16	UCO Bank	31	ICICI
17	Union Bank of India	32	Indusind Bank
18	United Bank of India	33	Yes Bank

(TO BE STAMPED IN ACCORDANCE WITH STAMP ACT AND THE EXPIRY DATE OF BG MUST BE AFTER 60 DAYS FROM THE DATE OF COMPLETION OF WARRANTY PERIOD)

PERFORMANCE BANK GUARANTEE

In accordance of M/s. Bharat Heavy Electricals Limited (A Government of India undertaking, a company incorporated under the Companies Act 1956 having its Registered Office at "BHEL House", SIRI Fort, New Delhi 110 049) through its High Pressure Boiler Plant Division located at Tiruverumbur, Tiruchirapalli- 620 014 (hereinafter called 'the Company') having entered into a contract withhereinafter called ' the said contractor ' which term includes 'suppliers' for the purpose of this Bond and under the terms and conditions of the contract No..... Dt Between BHEL, Trichy and as per the contract, the contractor / supplier is to furnish a performance Bank guarantee for Rs. for the due performance of the equipment to be supplied under the above referred contract and for the fulfillment of all the terms and conditions of the contract, We(indicate the name of the bank) (herein after referred to as the bank) at the request of (Contractor(s)) do here by undertake to pay the company an amount not exceeding Rs.....against any loss or damage caused to or suffered or would be caused to or suffered by the company by reason of any breach by the said contractor (s) of any of the terms and conditions contained in the said agreement.

2. We(indicate the name of the bank with full address), do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the Company stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by the Company by reason of breach by the said Contractor(s) of any of the terms and conditions contained in the said Agreement or by the reason of the contractor(s) 'failure to perform' the said agreement. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____.

3. We undertake to pay unconditionally to the Company any money so demanded notwithstanding any dispute(s) raised by the Contractor in any suit, or proceedings pending before any Court or Tribunal or Arbitration or before any other authority relating thereto our liability under this present being absolute and unequivocal. The payment under this guarantee would not wait till the disputes have been decided by any Court or Tribunal or in the arbitration proceedings or by any other authority. The payment so made by us under this Bond shall be a valid discharge of liability for payment thereunder and the Contractor(s) shall have no claim against us for making such payment.

4. We.....(indicate the name of Bank), further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Agreement and that it shall continue to be enforceable till all the dues of the Company under or by virtue of the said Agreement have been fully paid and its claims satisfied or discharged or till _____ Office / Department/ Division of the Company certifies that the terms and conditions of the said Agreement have been fully and properly carried out by the said Contractor(s) and accordingly discharges this guarantee.

5. (I) Unless a demand or claim under this guarantee is made on us in writing on or before the _____ we shall be discharged from all the liability under this guarantee thereafter. But where such claim or demand has been preferred by the Company with the Bank before the expiry of the said date, the claim shall be enforceable notwithstanding the fact that the said enforcement is effected after the said date.

(ii) For the purpose of this clause, any letter making demand on the Bank by M/s. BHEL dispatched by Registered Post with Ack.Due or by Telegram or by any Electronic media addressed to the above mentioned address of the Bank shall be deemed to be the claim / demand in writing referred to above irrespective of the fact as to whether and when the said letter reaches the Bank, as also any letter containing the said demand or claim is lodged with the bank personally.

6. We(indicate the name of Bank), further agree with the company that the Company shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said agreement or to extend time of performance by the said Contractor (s) from time to time or to postpone for any time or from time to time any of the powers exercisable by the Company against the said Contractor(s) and to forbear or enforce any of the terms and conditions relating to the said Agreement and we shall not be relieved from our liability by any reason of any such variation or extension being granted to the said Contractor(s) or for any forbearance, act or omission on the part of the company or any indulgence by the company to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating would, but for this provision, have effect of not so relieving us.

7. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

8. It shall not be necessary for the company to proceed against the contractor before proceeding against the guarantor-bank and the guarantee herein contained shall be enforceable against them notwithstanding any security, which the company may have obtained or obtain from the Contractor shall, at the time when proceedings are taken against the guarantor hereunder be outstanding or unrealised.

9. Any claim or dispute arising under the terms of this document shall only be enforced or settled in the Courts at Tiruchirapalli.

10. The guarantor hereby declare that it has power to execute this guarantee and the executant has full powers to do so on its behalf under the proper authorities granted to him/them by the guarantor.

11. We(indicate the name of Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the company in writing.

In witness whereof we....., (indicate the name of Bank) have hereunto setout Bank Seal the _____ day _____ month 200

BANK E-MAIL ID:
BANK PHONE NO.
BANK FAX NO: