

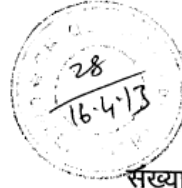
SI No	ITEM DETAILS						Casting Wt (Kg)	Qty	Unit Price CFR (Chennai) / FOR BHEL TRICHY (*)
	RM.Code	Description	Cast Drg	M/C Code	M/C Component Description	M/C Drg			
1	922030780000	BODY-38-C600-GV-BW-WCC-F999	1VF99905256R/000/00	932028150000	BODY-F999	2VF99914788/000/00	6900	11	
2	922030730000	BODY-38-C300-FV-BW-WC9	2VZ07714787R/002	932027618000	BODY ROUGH	2VZ07714840/00	3542	11	
3	922030990000	BODY-38-C300-FV-BW-WCB	2VZ07914787R/001	932028748000	BODY ROUGH	2VZ07914840/00	3542	11	
4	921528070000	BODY 32"600CL SPL WC9-LA14	2VLA1417555R/00	931225039000	BODY ROUGH 32" 600CL SPL WC9-LA14	2VLA1417628/000/00	6675	6	
5	921528420000	BODY 32"900CL WC9 SPL-LA41	2VLA4117615R/00	931226319000	BODY ASSEMBLY 32" 900CL WC9 SPL-LA41	2VLA4117627/000/00	8870	4	
6	921528610000	Body 44"150CL WC9-LA54	1VLA5413049R	954600110000	BODY ASSEMBLY 44" 150CL WC9-LA54	2VLA5417625	5035	10	
					Grand Total			53	

\* Supplier should mention the unit price in the respective column  
FOR BHEL TRICHY - For Indegenous bidders.  
CFR - COST AND FREIGHT Chennai Sea port - for Import bidders.

**LIST OF CONSORTIUM BANKS**

Annexure: H

Sl. No.	BANKS
1	STATE BANK OF INDIA
2	PUNJAB NATIONAL BANK
3	HDFC BANK
4	SYNDICATE BANK
5	CANARA BANK
6	INDIAN BANK
7	ST. BANK OF HYDERABAD
8	ICICI BANK
9	STANDARD CHARTERED BANK
10	UCO BANK
11	KOTAK MAHINDRA
12	ORIENTAL BANK OF COMMERCE
13	STATE BANK OF TRAVANCORE
14	CENTRAL BANK
15	IDBI BANK
16	FEDERAL BANK
17	HSBC LTD
18	DEUTSCHE BANK
19	CORPORATION BANK
20	CITI BANK
21	BANK OF BARODA
22	ABN AMRO BANK
23	UNITED BANK OF INDIA
24	VIJAYA BANK
25	UNION BANK OF INDIA
26	PUNJAB & SIND BANK
27	ANDHRA BANK
28	BANK OF INDIA
29	AXIS BANK



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

(DEPTT. OF INDUSTRIAL POLICY & PROMOTION)

UDYOG BHAWAN, NEW DELHI-110107,

दिनांक/ Dated, the 3<sup>rd</sup> April, 2013

To

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

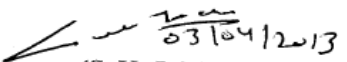
**Subject: List of recognised Inspecting/Competent Authorities, Well Known Steel Makers, Foundries/Forgings units, Tube/Pipe Makers, Material Testing Laboratories and Remnant Life Assessment Organizations under Indian Boiler Regulations as on 31<sup>st</sup> March, 2013.**

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 31<sup>st</sup> March, 2013 for your reference and record.

Thanking you,

Yours faithfully,

  
23/04/2013

(S. K. Jain)

Development Officer &

Assistant Secretary, Central Boilers Board

Tel.No.011-23063166

  
M.V. B.R.K.  
2

Encl: "As above"

**INSPECTING AUTHORITIES**

(As on 31/03/2013)

<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

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

- |     |   |  |
|-----|---|--|
| 32. | M/s RSA<br>(Formerly Royal & Sun Alliance plc)<br>17 York Street,<br>Manchester, M2 3RS,<br>United Kingdom                                      | Europe   |
| 33. | M/s. Japan Inspection Company Limited,<br>No.10-7, 1-Chome, hatchobori, Chou-ku,<br>Tokyo, 104-0032, Japan                                      | All countries in Asia except<br>India  |
| 34. | M/s. S.G.S. Korea Company Limited,<br>Industrial Division,<br>647-2, Sinpyeong-dong,<br>Saha-gu, Busan,<br>KOREA (604-030).                     | Korea & Japan  |
| 35. | M/s Bureau Veritas,<br>67-71, Boulevard du Chateau,<br>92200 Neuilly-sur-Seine,<br>FRANCE   | All countries except India.  |
| 36. | M/s. Lloyds Register Verification Ltd.,<br>71, Fenchurch Street,<br>London EC 3M, U.K.  | All countries except India.  |
| 37. | M/s. Velosi Certification Bureau Ltd.,<br>Unit 1 Woodside Business Park,<br>Whitley Wood Lane,<br>Reading, Berkshire, RG2 8LW<br>United Kingdom | Europe, Middle East<br>Countries, China, Malaysia<br>Singapore & USA                           |
| 38. | M/s TUV Rheinland Brandenburg P falz e.V.,<br>Am Grauen stein, D-51105 Klön,<br>Germany   | Europe , Japan, China &<br>Korea   |
| 39. | Technischer Überwachungs-Verein Saarland e.V.,<br>Am Tuev 1,<br>66280 Sulzbach,<br>Germany  | Europe   |
| 40. | M/s OOO "TekhnoLogicheskieEnergostime"<br>1. Kalinia St. Belgorod, 308001<br>Russia   | Russia, China, Ukraine, USA<br>& Germany   |
| 41. | M/s Engineering Bureau Franke<br>International,<br>55, Amurskaya St.,<br>Dnepropetrovsk<br>49108, Ukraine                                       | Ukraine, Russia, Belarus, China ,<br>Uzbekistan, Poland, Belgium, Romania,<br>& Czech Republic |

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|-----|--|--|
| 42. | M/s. ARISE Boiler Inspection & Insurance Company Risk Retention Group,<br>Grand Bay 1, 7000 South Edgerton Road,<br>Suite 100, Brecksville,<br>OH 44141 USA  | USA & Canada                                 |
| 43. | Tata Projects Limited,<br>"Mithona Towers-I", 1-7-80 to 87,<br>Opp. Wesley Co-Ed. Jr. College,<br>Prenderghast Road,<br>Secunderabad- 500 003, (India)   | All countries except India                   |
| 44. | M/s TUV SUD Industrie Service GmbH,<br>Wstendstr. 199,<br>80686 Munich,<br>Germany   | All countries except India                   |
| 45. | M/s Germanischer Lloyd Industrial Services GmbH,<br>Steinhoeft 9,<br>20459 Hamburg,<br>Germany   | All countries except India                   |
| 46. | M/s. TUV Thuringen e.V.,<br>Business Division Steam and Pressure Technology,<br>Melchendorfer Str. 64,<br>99096 Erfurt,<br>Germany   | Europe                                       |
| 47. | M/s. SGS-CSTC Standards Technical Services Co. Ltd.<br>9 <sup>th</sup> Building, No. 69,<br>KangQiao Industrial Park, Block 1159,<br>KangQiao East Road, Pudong District,<br>Shanghai-201 319<br>China | China  |
| 48. | M/s Moody International Limited,<br>Hayworthe House, Market Place,<br>Haywards Heath, West Sussex,<br>United Kingdom   | All countries except India                   |
| 49. | M/s ABSG Consulting Inc.,<br>16855 Northchase Drive,<br>Houston, TX 77060<br>United States of America  | All countries except India                   |
| 50. | M/s. Hartford Steam Boiler Inspection and Insurance Company of Connecticut,<br>One State Street, 8 <sup>th</sup> Floor<br>Hartford, CT 06141-0299<br>U.S.A.  | All countries except India and China         |
| 51. | M/s. Certification Engineers International Limited,<br>D 101-106, First Floor,<br>International Technology Centre,<br>CBD Belapur Station Complex, Navi Mumbai-400 614                                 | All countries in Europe, Middle East & China |
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70-006

# Bharat Heavy Electricals Limited

High Pressure Boiler Plant, Tiruchirappalli-620 014, India.

Grams : BHARATELEC

Phone : 

Telex : 0455 - 211, 212, 205 &amp; 200

FAX : 91 - (0431) - 52710

## PRODUCT ENGINEERING/VALVES

VL:STDC:023

REV.00

PAGE 1 OF 6

### TDC FOR UNTOLERANCED DIMENSIONS IN CASTING & FORGING DRAWINGS

#### Scope :

This technical delivery condition specifies the tolerance for the untoleranced dimension for the castings and forgings wherever tolerances are not specified in the applicable drawing applicable material TDC.

#### A. Castings :

Nominal dimension (in mm)	Tolerance on diameter or height (in mm)
UPTO 4	± 0.5
OVER 4 UPTO 16	± 1.0
OVER 16 UPTO 65	± 1.5
OVER 65 UPTO 125	± 2.0
OVER 125 UPTO 250	± 2.5
OVER 250 UPTO 500	± 3.0
OVER 500 UPTO 1000	± 4.0
OVER 1000 UPTO 1600	± 5.0

B. Forgings : As per Table (1), (2), (3) & (4)

  
PREPARED

  
CHECKED

  
APPROVED  
(S. KUMAR)  
SM/PE/USA  
28/2/94

Product : **STEEL CASTINGS (VALVES)- IMPORTED**Document No: **TDC:0:433**Rev No : **00**Effective Date: **15.07.2011**

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**1.0 MATERIAL:**

Specification : ASME / ASTM {Latest on date of Purchase Order (PO)}:  
 CARBON STEEL (CS) : SA / ASTM A216 WCB, WCC & 352 LCB , LCC  
 ALLOY STEEL (AS) : SA / ASTM A217 WC6, WC9, C12A.  
 STAINLESS STEEL (SS): SA / ASTM A351 CF3M,CF8,CF8C & CF8M.  
 Additional Requirement : As listed below(Supplementary to Specification)  
 Size, Qty, Grade/Class : As per Purchase order & Drawing / Pattern.

**2.0 CHEMICAL COMPOSITION AND PROCESS:**

Melting: As per the Specification, Fully Killed.  
 Carbon= 0.25% maximum : for SA / ASTM A216 WCB only.  
 Carbon= 0.15% maximum : for SA / ASTM A217 WC6 & WC9  
 Product Analysis on test bar for each melt including residual elements shall be carried out and reported in Test Certificates.

**In case of API-6D materials the following additional requirements shall be met:**

CS: Carbon=0.23% max.(in ladle) and 0.25% max.(in Product analysis)  
 Carbon Equivalent=0.43 max.(in ladle) and 0.45 max.(in Product analysis)  
 Carbon Equivalent= $\%C+(\%Mn/6)+(\%Cr+\%Mo+\%V)/5+(\%Ni+\%Cu)/15$   
 SS: Carbon=0.03% max. except as below.  
 Carbon=0.08% max.for stabilized steels with Nb >10xC.and  
 for stabilized steels with Nb and Ta mass of (Nb+Ta)>8xC.

**3.0 DIMENSIONS AND TOLERANCES:**

Tolerances as per the Drawing.  
 Non tolerance Dimensions for valve components as per the Drawing:VL:STDC:023 (Latest)

**4.0 HEAT TREATMENT :(HT)**

CS. Castings of High Pressure Valve.(Cl.1500 & above),QCNRV & CRHNRV: Shall be in Annealed Condition.  
 AS. Castings: Normalized and Tempered.  
 SA/ASTM A217 WC6 :Normalizing Temperature 920-950 °C and Tempering Temperature 680 °C (Minimum)  
 SA/ASTM A217 WC9 :Normalizing Temperature 920-950 °C and Tempering Temperature 720 °C (Minimum)  
 SA/ASTM A217 C12A: Normalizing Temperature 1050-1080 °C and Tempering temperature 750-780°C  
 Others: Heat Treat as per the Specification.

**5.0 MECHANICAL TESTS:**

Test bars to be cast integral with the casting or separately. If cast separately, they shall be cast at the same time as the castings and from the same ladle. A metal strip with heat number stamped shall be fused with the test bar during casting, to maintain traceability. If one(1) casting is made from more than one heat, separate test bars for each heat/cast to be poured & all test bars shall satisfy the requirements. Following tests to be conducted per heat / Heat treatment batch, as per ASTM A370. .

S. NO	TEST	Material specification				
		SA/ASTM A216, 217		SA/ASTM A352	SA/ASTM A 351	
1	Tension Test	As per the Specification				
2	Hardness Test	As per the Specification		225 BHN. max.	Not applicable	
3	Bend Test Specimen 1"x 3/4"		Angle of Bend	Dia of Pin	Not applicable	S3 of SA703
		WCB	90°	2t		
		WCC	90°	2t		
		WC6	120°	3t		
		WC9	90°	3t		
C12A	90°	2t				
4	Charpy- U Impact for all Quick Closing Non-Return Valve, Cold Re-Heat Non-Return Valve Bodies FOR IBR.	As per IBR. at Room temperature. Acceptance: Avg /Single=36J/32J min.		Not applicable	Not applicable	
5	Charpy- V Impact for Low-Pressure Bye-pass Valve BODIES.	At 20 Deg.C temperature. Acceptance: Avg /Single=27J/21J min.		Not applicable	Not applicable	

In addition to above IMPACT Test for API -6D and PED Valves shall be done as below

S. NO	TEST	Material specification			
		SA/ASTM A216, 217	SA/ASTM A352	SA/ASTM A 351	
1	Charpy- V Impact for CE Marking-Pressure Equipment Directive (PED) items as Specified in the Purchase Order.	At 20 Deg.C temperature. Acceptance: Avg /Single=40J/27J min.		As per Specification	Not applicable
2	Charpy- V Impact for API -6D items if design temperature below minus 29°C (-29 °C)	Test Temperature=As per specification Acceptance: Avg/Single=34J/25J		As per Specification	Not applicable

Product : **STEEL CASTINGS (VALVES)- IMPORTED**Document No: **TDC:0:433**Rev No : **00**Effective Date: **15.07.2011**

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**6.0 FETTLING, DRESSING & CLEANING:**

- Dressing of castings- Free from risers, in gates, notches, undercuts and deep marks etc.
- Fused wires, parting line fins, chills etc. shall be removed by grinding.
- Gas cutting if employed shall be done before Heat treatment.
- Preheat the material to 200 Deg. C. before gas cutting the Alloy steels.
- Castings shall be blast cleaned both inside and outside for the removal of fused sand, scales etc.
- Visual inspection of castings for surface quality as per MSS-SP-55 shall be carried out.

**7.0 NON DESTRUCTIVE TESTING (NDT) AFTER HEAT TREATMENT:**

The NDE requirements for the castings shall meet the following as shown in Table-1 below. Castings shall be free from surface and internal defects like porosity, shrinkage, sand inclusion, crack, cold shut and other harmful defects. All castings shall be of Radiographic Quality.

Radiographic Testing Procedure: As per ASME B16.34.

Magnetic Particle Inspection (MPI): As per ASTM E709

Liquid Penetrant Inspection (LPI): As per ASTM E165

**Table: 1**

Product	Components	Charecteristics	Type of NDE Check				
			RT	RT Area	RT Acc. Std	MT \$	MT Area
Conventional Valves (Gate, Globe & Check) and API 6D Gate Valves	Body, Bonnet	< 600Class	10%	ASME B16.34 (latest) as per SPL class Valve RT requirement	As per Table: 2	--	All accessible surfaces including belly
	Body, Bonnet	600Class & above	100%			--	
	Body, Bonnet & Wedge	1500Class & above	100%			100%	
		All Special Class Valves	100%			100%	
<u>Quick Closing Non-Return Valve &amp; Cold Re-Heat Non-Return Valve</u>	Body	150 & 300 Class	10%	Butt Weld Ends, Change of sections including seat and neck portion	As per Table: 2	100%	All accessible surfaces including belly
		600Class & above	100%			100%	
	Body (Special)	150 & 300 Class					
		600Class & above	100%			100%	
CRH Isolating Device	Body	< 600Class		100%	ASME B16.34 (latest) as per SPL class Valve RT requirement.		As per Table: 2
		600Class & above	--				
		1500Class & above	100%				

§ LPI Can be substituted for MPI in all inaccessible area and for stainless steel castings.

**Table: 2**

TYPE OF DISCONTINUITY	ACCEPTANCE LEVEL CATEGORY	< 600 CLASS		≥ 600 CLASS	
		Thickness ≤2"	Thickness >2"	Thickness ≤2"	Thickness >2"
Gas Porosity	A	A2	A3	A1	A2
Sand/Slag inclusion	B	B3	B3	B2	B2
Shrink Type-1	C	CA2	CA3	CA1	CA2
Shrink Type-2	C	CB3	CB3	CB2	CB2
Shrink Type-3	C	CC3	CC3	CC2	CC2
Crack	D	NONE	NONE	NONE	NONE
Hot Tear	E	NONE	NONE	NONE	NONE
Unfused Inserts (Chills/Chaplets)	F	NONE	NONE	NONE	NONE
<p>a. Butt welding ends shall be free of shrinkage, crack &amp; hot tear.</p> <p>b. For butt weld ends Gas hole/Porosity and sand inclusions to be within level A1 &amp; B1 respectively</p>					

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**7.1 Acceptance for MPI & LPI: ASME B16.34.**

(1)Cracks are not permitted.

(2)For linear indications (with length &gt; 3 times width) other than cracks, indications must be separated by a distance greater than the length of an acceptable indication. Maximum allowable length of the indication shall be:

(a) For thickness (t) up to 13mm= 8mm,

(b) For thickness from 13 to 25mm = 13mm

(c) For thickness above 25mm =18mm.

(3)For rounded indications (circular or elliptical with length &lt; 3 times width), 4 or more indications in a line separated by 1.5 mm or less edge to edge are unacceptable. Maximum allowable diameter of the indication shall be:

(a)For thickness up to 13mm =8mm, and

(b)For thickness above 13mm =13mm

**8.0 Development Stage of Casting:**

a. During developmental stage, RT on sample castings (3 Castings with nominal bore (NB) ≤100mm. & 1 casting with NB > 100mm) for each type of casting shall be carried out on entire area of the casting to the acceptance requirement of Table-1 & 2. In addition 100% MPI on all critical areas like change of sections, riser & in gate portions shall be carried out. If machining operation is involved the same shall be done and defect free condition shall be ensured. If any defect noticed in RT and machining, the type of defect shall be analysed and accordingly size of gate, runner, riser and pouring methodology to be modified to get defect free casting. Sampling shall be continued till achieving sound casting. After satisfactory development of sampling bulk production shall be started. However weld repaired areas identified in visual examination for doubtful indications to be probed by MPI.

b. During developmental stage RT on sample castings of yoke, yoke clamp & wedge/disc shall meet Level-3 of ASTM E446/E186/E280

**9.0 REPAIR:**

Castings with unacceptable cracks, hot tears, shrinkage, etc. to be rectified by grinding & if required by welding. Welding to be done by qualified welder and the procedure used for welding shall be qualified in accordance with ASTM A 488/ASME Section IX.

.For IBR items welder shall be qualified as per IBR and approved by IBR approved Inspecting Authority.

The welding consumables and parameters shall be as per the qualified procedures. The recommended welding consumables are given in Table below.

Casting Material	Electrode Specification	Minimum Preheat in ° C	Minimum Post heat Temperature in ° C	PWHT Temperature in ° C
A 216 WCB, A 216 WCC	E 7018 - A1	150	150 for 2 hours	595 to 625
A 217 WC6	E 8018 B2	220	220 for 2 hours	650 to 680
A 217 WC9, A 217 C5, CSN 422744	E 9018 B3	220	220 for 2 hours	675 to 705
A 217 C12A	E 9015 B9 E 9018 B9 Ref Note - 1	220-280	220-280 for 2 hrs	750 to 770
A 217 CA15	E 410	220	220 for 2 hours	760 to 790
A 351 CF3M, A 351 CF8M	E 316	Nil	Nil	Nil
A 351 CF8, A 351 CF8C	E 347	Nil	Nil	Nil

**Note – 1:**

A. The following welding filler materials only shall be used.

**Cromocord 9 M (Oerlikon)**

**Fox C 9 MV (Bohler)**

**Cromo 9V (Thyssen)**

B. C12A castings to be Post weld heat treated irrespective of depth or size of repair

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9.1 All repaired areas after PWHT shall be subjected to NDE and Hardness test. Hardness shall meet material Specification. (If Specified)

#### 10.0 SURFACE TREATMENT:

SS castings to be pickled & passivated (after repair & HT if any) as per ASTM A380. Satisfactory passivity of the surface to be checked using SS passivity test kit (Free iron test). After passivation, rinsing & test, the rinsed demineralised water to be checked for chloride with 1% Silver nitride, which shall not exceed 0.5 PPM

#### 11.0 DIMENSIONAL CHECK:

- Dimensional reports for Sample castings and for All fully Machined castings are to be furnished along with other Certificates.
- For all QCNRV & CRHNRV Body Castings, thickness of the body shall be checked on throughout the surface on a grid of 100mm x 100mm and recorded & reports to be submitted to BHEL.

#### 12.0 MARKING AND PACKING:

Following details to be marked on each casting on a raised pad using low stress stamps and Castings shall be suitably packed to avoid damage during transit.

- Foundry code, 2.Specification, grade & Melt number, 3.Other details as per drawing.

#### 13.0 INSPECTION AND CERTIFICATION:

13.1: For IBR items

a) If the Foundry is recognized as "Well known Foundry" under IBR, Items shall be inspected by foundry and works certificate along with IBR *Form III F* shall be issued.

b) If the Foundry is not recognized as "Well known Foundry" under IBR, Items shall be inspected by an Inspecting Authority approved by IBR and work certificate along with IBR *Form III G* shall be issued.

13.2: For CE-marking items the materials shall be inspected by M/s. LLOYD'S/ TUV/ BVQI or any other agency approved for PED of CE marking, if the foundry is not certified to ISO 9000 by any of the above organisation.

13.3 For API items, the castings shall be inspected by the foundry and works certificate with details like PSL No., Temperature class rating, size shall be issued.

13.4 Test certificates shall contain the following details.




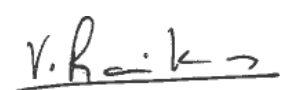
- Purchase Order No.(BHEL),TDC No. & Test certificate number
- Specification and Grade with applicable year of code, Heat Number, Quantity & Size
- Steel making process, Chemistry including incidental elements - Heat wise.
- Heat treatment details of the material and test bars.
- Mechanical test results, NDE test results with reference & acceptance standard.
- Repair details including HT, if any, Cleaning & Surface treatment details.
- Any other information like clearance of sample casting.
- Dimensional Inspection Report where applicable.

#### 14.0 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. Items found defective during check or subsequent processing at BHEL are liable for rejection.

#### 15.0 END USE:

For use in valves and other components like flanges, fittings etc. for high temperature & high pressure applications meeting IBR, ASME Section I, ASME B 16.34, PED and API.

			
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