

<b>Laboratory</b>	<b>Plant Laboratory, Bharat Heavy Electricals Limited, Tiruchirappalli, Tamil Nadu</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Mechanical Testing</b>	<b>Issue Date</b>	<b>08.12.2014</b>
<b>Certificate Number</b>	<b>T-0006</b>	<b>Valid Until</b>	<b>07.12.2016</b>
<b>Last Amended on</b>	<b>-</b>	<b>Page</b>	<b>1 of 3</b>

<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
<b>I. MECHANICAL PROPERTIES OF MATERIALS</b>				
<b>1.</b>	<b>Steel-Plates Sections Tubes Pipes and weld joints</b>	Tensile Test: Tensile strength Yield strength 0.2 % Proof strength (PS)  % Elongation % Reduction in area  Charpy Impact Test  Bend Test	ASTM A370-2014 E8-13A IS 1608: 2005    ASTM A370-2014 ASTM E23-12C  ASTM A370-2014 IS 1599: 1985	Rounds upto Ø 30 mm Flats upto 45 mm thickness Load capacity: 10 kN to 1000 kN  60 % Max. 95 % Max.  2.5 J to 80 % of max Capacity of 750 J; Temp: 30 °C to -70 °C  Mandrel Diameter: 6,8,10,12,15,20,25,30,40, 60,75,90,100& 120 mm Load capacity: 60 kN
<b>2.</b>	<b>Steel tubes</b>	Flattening Test For Tubes  Flaring Test For Tubes	ASTM A370-2014 IS 2328: 2008  ASTM A370-2014 IS 2335: 2008	Tube Diameter 10 mm to 120 mm  Tube Diameter 10 mm to 120 mm
<b>3.</b>	<b>Austenitic stainless steel castings and weld metals</b>	Delta Ferrite by magnetic method	AWS A4.2M-2006	0 to 15 FN
<b>4.</b>	<b>Ferritic steel and weld joints</b>	Pellini Drop Weight Test	ASTM E-208-06 (2012)	P-2 Type Specimen Temp: 30 °C to - 70 °C

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5.	<b>Steel products and weld joints</b>	Vickers Hardness Test	ASTM E384-11e1 IS 1501: 02	Load 49, 98, 294 N; 150 to 1000 HV max.
		Brinell Hardness Test	ASTM E10-12 IS 1500: 2005	2.5mm/187.5 kgf 10 mm/29.4 kN 150 HBW to 450 HBW Max.
		Rockwell Hardness Test	ASTM E18-14 IS 1586: 2012	B-Scale 40 HRBW to 75 HRBW 70 HRBW to 100 HRBW C-Scale 20 HRC to 59 HRC 60 HRC to 65 HRC
		Micro Hardness Vickers Test	ASTM E384-11e1	Load 100 g, 300 g and 1000 g, 150 HV to 1000 HV Max.

## **II. METALLOGRAPHY TEST**

Macro-structural Analysis	ASTM E340-13 ASTM E 381-01 (2012)	Magnification: 6.3X to 50X
Micro-structural Analysis	ASM Metals Hand book Vol.7-1972 ASTM E407-07e1	Magnification: 50X to 1000X
Replication & Metallography	ASTM E1351-01 (2012) ASM Metals Hand book Vol.7-1972	Magnification: 50X to 1000X

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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Metallography Test	Case Depth Measurement by Traverse method	IS 6416: 88 (RA 2003) SAE J423-Feb.98 Clause 5.2	0.035 mm to 0.075 mm 0.075 mm to 0.2 mm More than 0.2 mm 150 HV <sub>0.3</sub> to 1000 HV <sub>0.3</sub>

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