

**Laboratory** Quality Control Lab of Jindal Steel & Power Ltd., Kharsia Road, Raigarh, Chhattisgarh

**Accreditation Standard** ISO/IEC 17025: 2005

**Certificate Number** TC-7548 (in lieu of T-1393, T-1394)

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**Validity** 21.07.2018 to 20.07.2020

Last Amended on --

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
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**CHEMICAL TESTING**

I.	<b>METALS &amp; ALLOYS</b>			
1.	Low Alloy Steel	Carbon	ASTM E 415: 2017	0.010% to 1.40%
		Silicon		0.015% to 2.00%
		Manganese		0.040% to 1.91%
		Phosphorous		0.003% to 0.15%
		Sulphur		0.002% to 0.350%
		Chromium		0.020% to 3.50%
		Molybdenum		0.002% to 1.00%
		Nickel		0.005% to 4.50%
		Aluminum		0.002% to 2.0%
		Copper		0.003% to 3.20%
		Niobium		0.002% to 0.400%
		Titanium		0.002% to 0.25%
		Vanadium		0.002% to 0.50%
		Tungsten		0.010% to 0.75%
		Lead		0.003% to 0.25%
		Tin		0.005% to 0.30%
		Arsenic		0.001% to 0.100%
		Calcium		0.0008% to 0.0053%
		Boron		0.0005% to 0.0116%
		Zirconium	0.002% to 0.060%	
		Nitrogen	0.0020 to 0.0500	
		Oxygen	ASTM E-1019: 2011	0.0013% to 0.0450%
		Nitrogen		0.0020% to 0.0450%
Sulphur	0.0010% to 0.35%			
Carbon	IS:228(Part-22): 2003 RA 2014	0.020% to 1.50%		
Hydrogen		0.0002% to 0.0006%		

**K. Siribabu**  
Convenor

**Jitendra B. Vispute**  
Program Manager

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<b><u>MECHANICAL TESTING</u></b>				
<b>I. MECHANICAL PROPERTIES OF METALS</b>				
<b>1</b>	<b>Metallic Material Ferrous Materials</b>	Yield Strength	IS 1608: 2005	150 MPa to 800 MPa
		02% Proof Stress	ASTM A 370: 2015	150 MPa to 800 MPa
		Ultimate Tensile Strength	BS EN ISO 6892:2016	300 MPa to 1500 MPa
		Elongation		5 % to 60 %
		Reduction area		5% to 80 %
		Bend	IS 1599: 2012	Qualitative (Mandrel Dia 8,10,12 ,14, 18,20,25,30,40,50,60,70 mm)
		Impact Charphy -((-)40°C to 40° C))	IS 1757:1988 BS EN ISO 148-1:2016	2 J to 300 J
		Brinell	IS 1500: 2013 ASTM A 370 :2015	50 HBW to 400 HBW (10mm/3000kgf)
		Residual Test	EN 13674: 2011	Up to 250 MPa
		Fatigue -High Cycle Fatigue	EN 13674: 2011 ASTM E 606: 2012	Qualitative (Endure 10 Million Cycle and specimen did not break)
Fracture Toughness	EN 13674: 2011 ASTM E 399: 2017	2000 N to 20000N		

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