

Laboratory Manjula Laboratories, 13-B, Friends Industrial Estate, Focal Point,
Ludhiana, Punjab

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7820 (in lieu of T-0251 & T-0252)

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Validity 20.10.2018 to 19.10.2020

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.	METALS & ALLOYS			
1.	Ferrous base Plain carbon steel Mild steel Low alloy steel	C	IS 8811-1998 (RA 2012) ASTM E415:2017	0.05 % to 1.00 %
		Mn		0.10 % to 1.50 %
		S		0.005 % to 0.060 %
		P		0.005 % to 0.070 %
		Si		0.05 % to 0.75 %
		Cr		0.05 % to 3.75 %
		Ni		0.05 % to 2.00 %
		Mo		0.05 % to 0.75 %
		Cu		0.05 % to 0.50 %
		Al		0.005 % to 0.20 %
		V		0.05 % to 0.60 %
		B		0.0007 % to 0.010 %

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Steel	Tensile Test	IS 1608:2005 (RA 2011) ASTM A370-2017	250 MPa to 1400 MPa (20 kN to 1000 kN) 1% to 70% 3% to 70%
		Tensile Strength		
		Yield Strength		
		%Elongation		
		%Reduction Area		
		Tensile Strength Under Wedge Load	IS 1367 (Part 3): 2017 ASTM A370-2017	0.05 kN to 1000 kN
		Proof Load for Nut	IS 1367 (Part 6):1994) (RA 2015) ASTM 370-2017	0.05 kN to 1000 kN
		Rockwell Hardness	IS 1586 (Part 1): 2012 ASTM A370-2017	20 HRC to 65 HRC 50 HRB to 100 HRB
		Brinell Hardness	IS 1500 (Part 1): 2013	110 HBW to 500 HBW 2.5mm Ball @187.5 kgf load
		Vickers's Hardness	IS 1501 (Part 1):2013	100 HV30 to 725 HV30 5 kgf to 50 kgf
		Charpy Impact	IS 1757 (Part 1):2014	2J to 300J (At 0°C & Room Temp)
II.	METALLOGRAPHY TEST			
1.	Steel	Grain Size	IS 4748:2009 (Microscopic method)	1 to 10 100X
		Inclusion Rating	IS 4163:2004 (RA 2010) (Microscopic method)	100X (A,B,C,D:1,2,3,4)
		Decarburization Depth	IS 6396:2000 (RA 2018) (Microscopic method)	0.01mm to 0.80mm 100X