

Laboratory **Reliable Testing Services, 59, Bindal Industrial Estate, K-A Road, Sakinaka, Mumbai, Maharashtra**

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

Certificate Number **TC-5851**

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Validity **19.11.2018 to 18.11.2020**

Last Amended on **12.02.2019**

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.	METAL AND ALLOYS			
1.	Carbon Steel & Low Alloy Steel	Carbon	Spectro Analysis Based on ASTM E415:2017	0.020 % to 0.45 %
		Manganese		0.35 % to 2.0 %
		Silicon		0.01 % to 1.2 %
		Sulphur		0.001 % to 0.08 %
		Phosphorus		0.006 % to 0.13 %
		Chromium		0.04 % to 1.8 %
		Nickel		0.04 % to 3.4 %
		Molybdenum		0.1 % to 0.5 %
		Aluminum		0.005 % to 0.07 %
		Nitrogen		IS 228 (Part 23): 2003
2.	Stainless Steel	Carbon	Spectro Analysis Based on ASTM E1086:2014	0.01% to 0.080 %
		Manganese		0.6 % to 1.90 %
		Silicon		0.35 % to 0.70 %
		Sulphur		0.010 % to 0.030 %
		Phosphorus		0.015 % to 0.040 %
		Chromium		16.00 % to 20.00 %
		Nickel		8.00 % to 12.00 %
		Molybdenum		0.10 % to 3.00 %
		Aluminum		0.003 % to 0.03 %
		Copper		0.070 % to 0.5 %
Vanadium	0.007 % to 0.13 %			
Titanium	0.002 % to 0.50 %			
Tungsten	0.05 % to 0.11 %			
Niobium/Columbium	0.02 % to 0.035 %			
Nitrogen	IS 228 (P-23):2003	0.010 % to 0.080 %		
3.	Aluminum And Aluminum Alloys	Silicon	Spectro Analysis Based on ASTM E1251:2017a	0.10 % to 12.0 %
		Iron		0.30 % to 0.70 %
		Copper		0.005 % to 3.0 %
		Manganese		0.005 % to 0.65 %

Ram Ashray
Convenor

Birendra Prasad Murmu
Program Manager

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		Magnesium		0.002 % to 0.45 %
		Chromium		0.003 % to 0.015 %
		Nickel		0.01 % to 0.70 %
		Zinc		0.005 % to 1.20 %
		Titanium		0.012 % to 0.25 %
		Lead		0.01 % to 0.4 %
		Tin		0.002 % to 0.24 %
4.	Copper Alloys	Zinc	Spectro Analysis Based on BS EN 15079:2015	0.45 % to 40.0 %
		Lead		0.02 % to 5.55 %
		Tin		0.005 % to 6.00 %
		Phosphorus		0.017 % to 0.08 %
		Manganese		0.015 % to 1.8 %
		Iron		0.18 % to 4.5 %
		Nickel		0.04 % to 8.0 %
		Silicon		0.003 % to 0.2 %
		Bismuth		0.002 % to 0.1 %
		Antimony		0.18 % to 0.5 %
		Aluminum	0.004 % to 13.5 %	
		Arsenic	0.002 % to 0.03 %	

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MECHANICAL TESTING

I. MECHANICAL PROPERTIES OF METALS				
1.	Ferrous & Non-Ferrous Materials (including Welded Metals & Alloys)	Tensile Test Tensile Strength Yield Strength 0.2% Proof Stress Elongation Area Reduction	IS 1608 ASTM A370 ASTM E8/E8 M BS EN ISO 6892-1 IS 1786 ASME Section IX	50 MPa to 2500 MPa 50 MPa to 1500 MPa 50MPa to 1500 MPa 1 % to 90% 5 % to 90%
		Bend Test	IS 1599 ASTM A370 ASME Section IX IBR-1950 ASME E290	Qualitative (Mandrel Diameter:12, 20, 25, 32, 40, 60, 80 , 105, 220 mm)
		Vickers Hardness	IS 1501-1 ASTM A370 ASTM E92	50 HV ₁₀ to 800 HV ₁₀ 100 HV ₃₀ to 800 HV ₃₀
2.	Ferrous & Non-Ferrous Materials	Brinell Hardness	IS 1500-1/ASTM A370 ASTM E10	95.9 HBW to 601 HBW (10/3000)
		Rockwell Hardness	IS 1586-1 ASTM A370 ASTM E18	20 HRA to 88 HRA 20 HRB to 100 HRB 20 HRC to 70 HRC
3.	Fabrications Tube to Tube Sheet Mock Up	Pull Out Test	ASME Section IX	Qualitative (Diameter: 10mm to 50mm)
4.	Ferrous & Non-Ferrous Materials (Tubes, Pipes)	Flattening Test	IS 2328 ASTM A370 ASTM B111/111M IBR-1950	Qualitative (Diameter: Upto 700mm)
5.	Ferrous Materials (including Welded Metals & Alloys)	Charpy Impact Test - "V" Notch	ASTM E-23 ASTM A370 IBR-1950-Reg-263	2 J to 300 J (Temperture:- 196°C to 25 °C)

