

Laboratory **Karnataka Material Testing & Research Centre, Shed No. G4, G5,
Industrial Estate, Gokul Road, Hubli, Karnataka**

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

Certificate Number **TC-5015**

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Validity **19.11.2018 to 18.11.2020**

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.	Carbon & Low Alloy Steel	Aluminium	ASTM E 415-17	0.01 % to 1.27 %
		Arsenic		0.002 % to 0.04 %
		Carbon		0.13 % to 0.48 %
		Chromium		0.22 % to 2.40 %
		Cobalt		0.009 % to 0.04 %
		Copper		0.02 % to 0.35 %
		Manganese		0.36 % to 1.51 %
		Molybdenum		0.14 % to 1.18 %
		Nickel		0.13 % to 2.11 %
		Nitrogen		0.004 % to 0.008 %
		Phosphorous		0.006 % to 0.02 %
		Silicon		0.17 % to 1.52 %
		Sulfur		0.006 % to 0.05 %
		Tin		0.001 % to 0.006 %
		Titanium		0.001 % to 0.01 %
		Vanadium		0.002 % to 0.01 %
2.	Austenitic Stainless Steel	Aluminium	ASTM E 1086-2014	0.009 % to 0.01 %
		Arsenic		0.001 % to 0.002 %
		Boron		0.003 % to 0.01 %
		Carbon		0.01 % to 0.10 %
		Chromium		14.27 % to 23.18 %
		Cobalt		0.04 % to 0.13 %
		Copper		0.02 % to 0.79 %
		Manganese		0.90 % to 1.57 %
		Molybdenum		0.84 % to 3.74 %
		Nickel		4.03 % to 13.32 %
		Nitrogen		0.01 % to 0.06 %
		Phosphorous		0.008 % to 0.11 %
		Silicon		0.29 % to 1.41 %

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		Sulphur		0.006 % to 0.05 %
		Tin		0.02 % to 0.05 %
		Titanium		0.04 % to 0.16 %
		Vanadium		0.02 % to 0.04 %
3.	Cast Iron	Carbon	ASTM E 1999-18	2.76 % to 4.15 %
		Silicon		1.43 % to 2.14 %
		Manganese		0.20 % to 0.30 %
		Phosphorus		0.04 % to 0.06 %
		Sulphur		0.003 % to 0.005 %
		Chromium		0.04 % to 0.06 %
		Molybdenum		0.0008 % to 0.001 %
		Nickel		0.57 % to 0.85 %
		Aluminium		0.010 % to 0.018%
		Copper		0.09 % to 0.14 %
		Vanadium		0.15 % to 0.23 %
		Boron		0.03 % to 0.04 %
		Titanium		0.08 % to 0.13 %
		Magnesium		0.03 % to 0.04 %
		Cerium		0.02 % to 0.03 %
4.	Aluminium and Its Alloys	Silicon	ASTM E 1251-2017a	3.14 % to 16.51 %
		Copper		0.01 % to 3.64 %
		Magnesium		0.002 % to 1.64 %
		Zinc		0.13 % to 0.63 %
		Tin		0.01 % to 0.17 %
		Nickel		0.005 % to 1.38 %
		Iron		0.16 % to 0.92 %
		Manganese		0.19 % to 1.02 %
		Chromium		0.02 % to 0.18 %
		Lead		0.002 % to 0.12 %
		Vanadium		0.005 % to 0.01 %
		Titanium		0.008 % to 0.19 %
		Bismuth		0.17 % to 0.26 %
		Cobalt		0.0004 % to 0.12 %
		Beryllium		0.03 % to 0.05 %

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5.	Nickel and Its Alloys	Carbon	KMT/Proc/Ni/76 Issue Date 24.01.2007	0.004 % to 0.006 %
		Silicon		0.02 % to 0.03 %
		Manganese		0.24 % to 0.37 %
		Phosphorous		0.008 % to 0.01 %
		Sulphur		0.001 % to 0.002 %
		Chromium		17.09 % to 25.64 %
		Molybdenum		10.69 % to 16.04 %
		Aluminium		0.19 % to 0.28 %
		Copper		0.05 % to 0.08 %
		Vanadium		0.13 % to 0.20 %
		Iron		3.47 % to 5.20 %
		Niobium		0.02 % to 0.03 %
		Tungsten		2.47 % to 3.70 %
		Cobalt		0.88 % to 1.33 %
6.	Copper and Its Alloys	Silicon	KMT/Proc/Cu/75 Issue Date 24.01.2007	0.05 % to 0.15 %
		Manganese		0.001 % to 0.50 %
		Phosphorus		0.28 % to 0.42 %
		Sulphur		0.03 % to 0.05 %
		Nickel		0.001 % to 0.64 %
		Aluminium		0.05 % to 3.93 %
		Arsenic		0.004 % to 0.12 %
		Copper		50.92 % to 90.00 %
		Lead		0.004 % to 0.94 %
		Magnesium		0.0007 % to 0.001 %
		Iron		0.005 % to 0.37 %
		Zinc		0.87 % to 38.79 %
		Tin		0.46 % to 11.36 %
		Antimony		0.26 % to 0.39 %

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Ferrous & Non Ferrous Metals	Tensile Test -0.2 % Proof Stress -Ultimate Strength -% Elongation -% Reduction of Area	ASTM A370-17a IS 1608:2018	20 kN to 600 kN load 20 kN to 600 kN load 1 % to 70 % 5 % to 80 %
2.	Springs	Static Load Test -Spring Rate	IS 7906-2:1975	20 kN to 600 kN load
3.	Steel Bars & Plates	Bend Test	IS 1599:2012	Qualitative (Mandrel Dia: 50, 44, 32, 28, 20, 16 & 12 mm)
4.	Steel Tubes & Pipes	Flattening Test	ASTM A370-17a IS 2328:2018	Qualitative (OD 10 to 250 mm)
5.	Metallic Materials	Rockwell Hardness B & C Scale	ASTM E18-17 IS 1586-1:2018	40 HRB to 100 HRB 20 HRC to 70 HRC
		Brinell Hardness Test	ASTM E10-17 IS 1500-1:2013 ASTM A370-17a	90 to 650 HBW 5/750 10/3000
		Vickers Hardness Test	ASTM E92-17 IS 1501-1:2013	(80 to 940) HV 30 (80 to 700) HV 10 (80 to 940) HV 5
6.	Welded Materials	Bend Test (Root, Face, Side)	ASME Section IX-2017 QW-160, 161, 162	Qualitative (Mandrel Dia: 50, 44, 32, 28, 20, 16 & 12 mm)
		Tensile Strength	ASME Section IX-2017 QW-150	20 to 600 kN load