

Laboratory Narang Metallurgical & Spectro Services, 1E/18, Ground Floor,
Jhandewalan Extension, Swami Ram Tirath Nagar, New Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7715 (in lieu of T-1505, T-1506)

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Validity 19.10.2018 to 18.10.2020

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
CHEMICAL TESTING				
I.	METAL & ALLOYS			
	Ferrous Metals			
1.	Low Alloy Steel	Carbon (C)	ASTM E-415	0.040 % to 1.40 %
		Silicon (Si)		0.0070 % to 1.10 %
		Manganese (Mn)		0.15 % to 1.50 %
		Chromium (Cr)		0.020 % to 3.0 %
		Nickel (Ni)		0.030 % to 3.0 %
		Molybdenum (Mo)		0.004 % to 1.0 %
		Sulphur (S)		0.002 % to 0.060 %
		Phosphorus (P)		0.004 % to 0.090 %
		Copper (Cu)		0.020 % to 0.50 %
		Vanadium (V)		0.009 % to 0.4 %
		Aluminum (Al)		0.015 % to 0.30 %
2.	Stainless Steel	Carbon (C)	ASTM E 1086	0.010 % to 1.10 %
		Silicon (Si)		0.20 % to 1.50 %
		Manganese (Mn)		0.70 % to 10.0 %
		Chromium (Cr)		14.14 % to 25.39%
		Nickel (Ni)		3.00 % to 20.00 %
		Molybdenum (Mo)		0.10 % to 2.50 %
		Sulphur (S)		0.007 % to 0.31 %
		Phosphorus (P)		0.010 % to 0.040 %
		Copper (Cu)		0.020 % to 2.00 %
		Cobalt (Co)		0.020 % to 0.20 %
		Vanadium (V)		0.030 % to 0.15 %
		Aluminum (Al)		0.010 % to 0.030 %
		Niobium (Nb)		0.22 % to 2.45 %
3.	Tool Steel	Carbon (C)	SOP : NMSS/LDM/TS/01	0.60% to 1.0%
		Silicon (Si)	Issue No: 01	0.15% to 0.30%
		Manganese (Mn)	Issue Date:01/07/2018	0.20% to 0.30%
		Chromium (Cr)		3.50% to 5.0%

Ashutosh D. Tatwawadi
Convenor

Battal Singh
Program Manager

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		Molybdenum (Mo)		0.40% to 10.0%
		Sulphur (S)		0.020 % to 0.030 %
		Phosphorous (P)		0.020 % to 0.030 %
		Vanadium (V)		1.00 % to 1.80 %
		Tungsten (W)		1.80 % to 18.00 %
		Cobalt (Co)		0.08 % to 8.00 %
4.	Cast Iron	Carbon (C)	ASTM E 1999	2.50% to 3.50%
		Silicon (Si)		0.20 % to 3.0%
		Manganese (Mn)		0.50 % to 0.80%
		Sulphur (S)		0.09% to 0.15%
		Phosphorus (P)		0.06% to 0.15%
	Non – Ferrous Metals			
5.	Aluminum & its Alloys	Silicon (Si)	ASTM E 1251 -17a	0.40 % to 11.50 %
		Manganese (Mn)		0.040 % to 0.40 %
		Iron (Fe)		0.15 % to 0.80 %
		Copper (Cu)		0.040 % to 2.50 %
		Magnesium (Mg)		0.15 % to 0.50 %
		Chromium (Cr)		0.020 % to 0.050 %
		Nickel (Ni)		0.004 % to 0.40 %
		Zinc (Zn)		0.020 % to 1.40 %
		Titanium (Ti)		0.020 % to 0.20 %
		Lead (Pb)		0.0040 % to 0.25 %
		Tin (Sn)		0.0020 % to 0.20 %
		Vanadium (V)		0.006 % to 0.020 %
6.	Copper & its Alloys	Tin (Sn)	BS EN 15079	0.010 % to 8.50 %
		Lead (Pb)		0.005 % to 8.40 %
		Zinc (Zn)		0.005 % to 40.0 %
		Nickel (Ni)		0.005 % to 4.94 %
		Phosphorus (P)		0.020 % to 0.94 %
		Iron (Fe)		0.005 % to 4.63 %
		Antimony (Sb)		0.005 % to 0.60 %
		Bismuth (Bi)		0.005 % to 0.062 %
		Aluminum (Al)		0.005 % to 9.80 %

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		Silicon (Si)		0.005 % to 0.15 %
		Manganese (Mn)		0.005 % to 0.30 %
		Arsenic (As)		0.005 % to 0.10 %
7.	Zinc & its Alloys	Aluminum (Al)	ISO 3815 – 1 (E)	0.020 % to 4.50%
		Copper (Cu)		0.010 % to 1.0 %
		Magnesium (Mg)		0.010 % to 0.080 %
		Lead (Pb)		0.010 % to 0.030 %
		Cadmium (Cd)		0.005 % to 0.020 %
		Iron (Fe)		0.0080 % to 0.030 %
		Tin (Sn)		0.0063 % to 0.020 %
		Nickel (Ni)		0.0020 % to 0.0050 %
		Manganese (Mn)		0.0050 % to 0.0090 %
II.	METALLIC COATINGS AND TREATMENT SOLUTIONS			
1.	Galvanized steel sheet, Barbed Wire	Mass of Zinc coating	IS 6745	50 g/m ² to 1000 g/m ²
2.	Hot dip galvanized threaded steel fasteners, structural steel, M.S. tube, round steel wire	Mass of coating Uniformity of coating	IS 6745 IS 2633	50 g/m ² to 1000g/m ²
3.	Tin coating on Tin plate	Mass of Tin coating	IS 1327	1 g/m ² to 100 g/m ²
III.	CORROSION TESTS			
1.	Galvanized steel sheet & allied coating on steel products	Salt spray test / corrosion test	ASTM B-117 ISO 9227	Qualitative (Visual Inspection)
IV.	RUBBER & RUBBER PRODUCTS			

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
1.	Rubber (Natural & Synthetic)	Ash Content	IS:3400 (Part-22)	1 % to 70 %
2.	Rubber Identification	Material Identification	IS:3400 (Part-22)	Qualitative
V.	PLASTICS & RESINS			
1.	Plastics & Polymers	Material Identification by FTIR / Chemical method	ASTM E 1252/ Chemical Method SOP : NMSS/LDM/FTIR/01 Issue No: 01 Issue Date:01/07/2018	Qualitative
VI.	PAINTS & SURFACE COATING			
1.	Primers	Viscosity (Flow Cup Method)	IS 101 (Part 1/Sec V) Clause. 3	10 to 200 s
		Consistency	IS 101 (Part 1/Sec V) Clause. 3	Qualitative
		Flash Point (Abel Cup)	IS 101 (Part 1/Sec VI)	20 to 40 °C
		Mass in Kg/10 L	IS 101 (Part 1/Sec VII) Clause. 3.1	7.0 to 15.0 kg
		Water content	IS 101 (Part 2/Sec I)	0.05 to 2 %
		Drying time • Surface Dry • Hard Dry • Tack Free	IS 101(Part 3/Sec I) Clause. 2.1	Qualitative (1-24 hrs)
		Finish	IS 101 (Part 3/Sec IV)	
		Fineness of Grind	IS 101 (Part 3/Sec V)	10 to 50 microns
		Gloss at 60°	IS 101 (Part 4/Sec IV) Clause. 2.3	40 to 100
		Scratch Hardness	IS 101 (Part 5/Sec II)	

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			Clause. 1(b)	Qualitative
		Bend test of adhesion	IS 101 (Part 5/Sec II) Clause. 1(a) & 2.2.2	Qualitative
		Pigment	IS 101 (Part 8/Sec II) Clause. 4.1	1 to 75 %
		Non-volatile matter	IS 101 (Part 8/Sec II) Clause. 4.1 & 7.2	1 to 75 %
2.	Ready Mixed Paint	Viscosity (Flow Cup Method)	IS 101 (Part 1/Sec V) Clause. 3	10 to 200 s
		Consistency	IS 101 (Part 1/Sec V) Clause. 3	Qualitative
		Flash Point (Abel Cup)	IS 101 (Part 1/Sec VI)	20 to 40 °C
		Mass in Kg/10 L	IS 101 (Part 1/Sec VII) Clause. 3.1	8.0 to 20.0 kg/10 L
		Water content	IS 101 (Part 2/Sec I)	0.05 to 2 %
		Drying time • Surface Dry • Hard Dry • Tack Free	IS 101 (Part 3/Sec I) Clause. 2.1	Qualitative (1-24 hrs)
		Finish	IS 101 (Part 3/Sec IV)	Qualitative
		Fineness of grind	IS 101 (Part 3/Sec V)	10 to 50 microns
		Gloss at 60°	IS 101 (Part 4/Sec IV) Clause. 2.3	40 to 100
		Scratch Hardness	IS 101 (Part 5/Sec II) Clause. 1(b)	Qualitative
		Bend test of adhesion	IS 101 (Part 5/Sec II) Clause. 1(a) & 2.2.2	Qualitative
		Pigment	IS 101 (Part 8/Sec II) Clause. 4.1	1 to 40 %
		Non-volatile matter	IS 101 (Part 8/Sec II) Clause. 4.1 & 7.2	1 to 90 %

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<u>MECHANICAL TESTING</u>				
I.	MECHANICAL PROPERTIES OF METALS			
1.	Steels, Aluminum, Cast Iron & Copper alloy products	Tensile Strength Yield Stress Elongation % 0.2 % Proof Stress	IS 1608	12 kN to 600 kN Round specimen 3 mm to 25 mm Ø, Flat specimen 1 mm to 25 mm thk 1.0 % to 75 % By Electronic Extensometer LC 0.3 kN
2.	Steels & Copper Alloys	Vickers hardness	IS 1501 (Part 1)	140 HV5 to 600 HV5 150 HV30 to 700 HV30
3.	Steels	Bend Test	IS 1599	400 kN Round Specimen 3 mm to 25 mm Ø, Flat specimen 2 mm to 25 mm thick at 90° Mandrel Diameter: 6,12, 16,20,24,32, 45 and 50mm)
4.	Steels	Torsion Test	IS:1717	For steel round wires 1.0 to 5.0mmØ LC 1
5.	Steels and Copper alloys	Brinell Hardness	IS:1501(PART1)	2.5/62.5 Kg 65 to 300 HBW 2.5 / 187.5 Kg 200 to 650 HBW

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6.	Steels	Rockwell Hardness	IS 1586 (Part 1)	20 HRA to 90 HRA LC 1 HRA 20 HRB to 90 HRB LC 1 HRB 20 HRC to 70 HRC LC 1HRC
7.	Steels	Charpy Impact (V) Notch	IS 1757	2 J to 300 J (-) 30 °C to 25 °C LC 2J
8.	Steels	Erichson Cupping Test	IS 10175 (Part 1)	0.5 mm to 25 mm travel 0.10 – 2.5mm LC 0.01mm
II.	METALLOGRAPHY TEST			
1.	Hardened Steel Products	Case Depth	IS 6416	100 x 0.05 -3.0 mm, LC 0.1 mm
2.	Cast Iron products	Classification of Graphite in Cast Iron	IS 7754	Qualitative
3.	Steel Products	Decarburized Depth	IS 6396	100 x 0.01 mm to 3 mm LC 0.01 mm
4.	Steel Products	Non Metallic Inclusion Rating	IS 4163	100 x (0.5 to 3)
5.	Steel Products	Grain Size	IS 4748	IS No:1~8 (100 x) 8~10 (200 x)
6.	Steel products & Cast Iron	Macro Examination	ASM Vol. IX	Qualitative (Visual examination)
7.	Steels and Cast Iron	Microstructure Examination	ASM Vol. IX	50 x, 100 x, 250 x,400 x
III.	RUBBER & RUBBER PRODUCTS			
1.	Rubber Products	Accelerated ageing	IS 3400 (Part 4)	70 to 250° C
		Hardness	IS 3400 (Part 2)	2 to 90 Shore A

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		Tensile strength	IS 3400 (Part 1)	1 to 500 N/mm ²
		Elongation at break	I 3400 (Part 1)	50 to 1000%
		Compression set	IS 3400 (Part 10)	0 to 25%