

Laboratory **Kanha Testing Labs Pvt. Ltd., 407/7-E, Kadipur Industrial Area, Gurgaon, Haryana**

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

Certificate Number **TC-6522 (in lieu of T-2690 & T-2691)**

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Validity **14.10.2017 to 13.10.2019**

Last Amended on **15.11.2017**

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 Alloy (Low Alloy Steel)	Carbon	ASTM E 415-2017 (By Optical Emission Spectrometer)	0.005 % to 1.1 %
		Manganese		0.01 % to 2.0 %
		Silicon		0.01 % to 2.25 %
		Sulphur		0.004 % to 0.35 %
		Phosphorus		0.004 % to 0.085 %
		Chromium		0.01 % to 2.50 %
		Nickel		0.01 % to 2.0 %
		Molybdenum		0.002 % to 1.13 %
		Copper		0.005 % to 0.35 %
		Aluminium		0.002 % to 0.075 %
		Cobalt		0.002 % to 0.18 %
		Niobium		0.002 % to 0.085 %
		Tin		0.002 % to 0.045 %
		Titanium		0.0009 % to 0.2 %
		Vanadium		0.002 % to 0.57 %
2.	Ferrous Alloy (Stainless Steel)	Arsenic	ASTM E 1086-2014 (By Optical Emission Spectrometer)	0.003 % to 0.1 %
		Boron		0.0003 % to 0.007 %
		Lead		0.004 % to 0.35 %
		Carbon		0.005 % to 0.25 %
		Manganese		0.05 % to 12.0 %
		Silicon		0.01% to 1.15 %
		Sulphur		0.002 % to 0.065 %
		Phosphorus		0.003 % to 0.065 %
		Chromium		9.5 % to 22.00 %
		Nickel		1.45 % to 12.0 %
		Molybdenum		0.01 % to 3.0 %
		Copper		0.01 % to 0.3 %
		Titanium		0.005 % to 0.25 %

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3.	Ferrous Alloy (Cast Iron)	Carbon	ASTM E 1999-11 (By Optical Emission Spectrometer)	1.9 % to 4.0 %
		Manganese		0.01 % to 1.8 %
		Silicon		0.01 % to 3.4 %
		Sulphur		0.008 % to 0.08 %
		Phosphorus		0.008 % to 0.96 %
		Chromium		0.008 % to 1.5 %
		Nickel		0.010 % to 1.5 %
		Molybdenum		0.005 % to 1.2 %
		Copper		0.005 % to 0.75 %
		Tin		0.005 % to 0.14 %
4.	Non Ferrous Alloy (Aluminium Base)	Titanium	ASTM E 1251-11 (By Optical Emission Spectrometer)	0.003 % to 0.12 %
		Vanadium		0.005 % to 0.22 %
		Manganese		0.008 % to 1.2 %
		Silicon		0.07 % to 25.0 %
		Chromium		0.005 % to 0.23 %
		Copper		0.003 % to 5.5 %
		Tin		0.03 % to 0.35 %
		Titanium		0.005 % to 0.28 %
		Iron		0.2 % to 1.6 %
		Lead		0.04 % to 1.28 %
5.	Non Ferrous Alloy (Copper Base)	Magnesium	BS EN 15079-15 (By Optical Emission Spectrometer)	0.008 % to 4.6 %
		Zinc		0.005 % to 5.7 %
		Nickel		0.005 % to 2.0 %
		Cobalt		0.02 % to 0.20 %
		Vanadium		0.003 % to 0.022 %
		Bismuth		0.03 % to 0.6 %
		Antimony		0.001 % to 0.004 %
		Beryllium		0.0035 % to 0.24 %
		Tin		0.03 % to 5.2 %
		Lead		0.01 % to 5.6 %
		Zinc		0.14 % to 41 %
		Nickel		0.58 % to 5.1 %
		Aluminium		0.07 % to 12 %

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		Iron		0.2 % to 5 %
		Manganese		0.15 % to 0.4 %
		Silicon		0.02 % to 0.3 %
		Cobalt		0.03 % to 0.35 %
		Phosphorus		0.02 % to 0.05 %
		Sulphur		0.05 % to 0.1 %
		Chromium		0.08 % to 0.15 %
		Arsenic		0.005 % to 0.05 %
		Magnesium		0.01 % to 0.03 %
		Silver		0.01 % to 0.05 %
		Bismuth		0.005 % to 0.06 %
		Antimony		0.01 % to 0.06 %
6.	Ferrous Alloy (Low Alloy Steel/ Carbon Steel)	Carbon	IS 228 (Part 1): 1987 (RA 2012)	0.05 % to 1.5 %
		Sulphur	IS 228 (Part 9): 1987 (RA 2014)	0.01 % to 0.25 %
		Silicon	IS 228 (Part 8): 1987 (RA 2014)	0.05 % to 5.0 %
		Manganese	IS 228 (Part 2): 1987 (RA 2012)	0.10 % to 2.0 %
		Phosphorous	IS 228 (Part 3): 1987 (RA 2012)	0.01 % to 0.5 %
		Nickel	IS 228 (Part 5): 1987 (RA 2014)	0.10 % to 5.0 %
		Molybdenum	IS 228 (Part 7): 1987 (RA 2014)	0.01 % to 1.5 %
		Chromium	IS 228 (Part 6): 1987 (RA 2014)	0.10 % to 5.0 %
		Copper	IS 228 (Part 15): 1992 (RA 2014)	0.050 % to 0.5 %
7.	Ferrous Alloy (Stainless Steel)	Carbon	IS 228 (Part 1): 1987 (RA 2012)	0.05 % to 1.1 %
		Sulphur	IS 228 (Part 9): 1987 (RA 2014)	0.01 % to 0.25 %

Birendra Prasad Murmu
Convenor

N. Venkateswaran
Program Director

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		Silicon	IS 228 (Part 8): 1987 (RA 2014)	0.10 % to 5.0 %
		Manganese	IS 228 (Part 2): 1987 (RA 2012)	0.10 % to 15.0 %
		Phosphorous	IS 228 (Part 3): 1987 (RA 2012)	0.01% to 0.30 %
		Nickel	IS 228 (Part 5): 1987 (RA 2014)	0.10 % to 20.0 %
		Molybdenum	IS 228 (Part 7): 1990 (RA 2012)	0.10 % to 4.0 %
		Chromium	IS 228 (Part 6): 1987 (RA 2014)	0.10 % to 30.0 %
		Copper	IS 228 (Part 15): 1992 (RA 2014)	0.05 % to 5.0 %
8.	Ferrous Alloy (Cast Iron)	Carbon	IS 12308 (Part 11): 1991 (RA 2012)	0.05 % to 2.5 %
		Sulphur	IS 12308 (Part 2): 1987 (RA 2012)	0.01 % to 0.25 %
		Silicon	IS 12308 (Part 6): 1991 (RA 2012)	0.05 % to 5.0 %
		Manganese	IS 12308 (Part 10): 1991 (RA 2012)	0.10 % to 2.0 %
		Phosphorous	IS 12308 (Part 5): 1991 (RA 2012)	0.01 % to 0.5 %
		Nickel	IS 12308 (Part 7): 1991 (RA 2012)	0.10 % to 5.0 %
		Molybdenum	IS 228 (Part 10): 1987 (RA 2014)	0.05 % to 1.5 %
		Chromium	IS 12308 (Part 8): 1997 (RA 2012)	0.10 % to 5.0 %
		Copper	IS 228 (Part 15): 1992 (RA 2014)	0.05 % to 0.5%
9.	Metals & Its Alloys	Density/ Specific Gravity	IS 4841:1982 (RA 2009) IS 5642:2014	1.0 gm/cm ³ to 10 gm/cm ³

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II.	PAINT & SURFACE COATINGS			
1.	Painted, Coated & Plated Components (Ferrous & Non Ferrous)	Corrosion - Salt Spray	IS 101 (Part 6 & Section1): 1988 (RA 2005) BS EN ISO 9227: 2012 ASTM B117: 2016 JIS Z 2371: 1994	Qualitative
2.	Painted, Coated & Plated Components (Ferrous & Non Ferrous)	Dry Film Thickness (Coating Thickness)	IS 101 (Part 3/Section 2):1989	5 µ to 1200 µ
3.	Zinc Coated Iron & Steel articles	Mass of Zinc Coating	IS 6745: 1972 RA16	5.0 g/m ² to 1500 g/m ²
4.	Metallic Product	Uniformity (Zinc Coated Articles)	IS 2633: 1986 (RA 2011)	Qualitative
III.	RUBBER & RUBBER PRODUCTS			
1.	Rubber Compound, Rubber Products and Others	Rubber Identification by Infrared Spectrophotometry	ASTM D3677:2010	Qualitative
		Ash Content	ASTM D 297: 2015	0.01 % to 50.0 %
		Carbon Black Content	IS 3400 (Part 22): 1984 (RA 2014)	1.0 % to 10.0 %
IV.	PLASTICS & RESINS			
1.	Plastics and Polymers, Raw Materials	Density/ Specific Gravity	ASTM D 792: 2013	0.8 g/cc to 5 g/cc
		Ash Content	ASTM D 5630: 2013	0.01 % to 50 %
		Glass Content	IS 10661: 1983 (RA 2013)	5.0 % to 55.0 %
		Water Absorption of plastic	ASTM D 570-98 (2010)	0.02 % to 2 %

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		Polymer Identification by Infrared Spectra (Except Polyethylene)	ASTM E 1252: 98 (RA 2013)	Qualitative
		Volatile Content	ASTM D 1620-60 (1969)	0.2 % to 3.0 %
		Carbon Black Content in olifin Plastic	ASTM D 1603: 2014	0.2 % to 7 %

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Ferrous, Non-Ferrous Materials/ Products (Steel Products, Cast Iron, Aluminum, Copper)	Tensile Strength	IS 1608:2005 (RA 2012)	50 N/mm ² to 1700 N/mm ²
		Yield Stress		50 N/mm ² to 1500 N/mm ²
		% Elongation		2 % to 80 %
		% Reduction Area		2 % to 80 %
		Hardness (Rockwell)	IS 1586 (Part 1):2012	HRA (20 to 88)
				HRB (20 to 100)
				HRC (20 to 70)
				HR15N (70 to 90)
				HR30N (42 to 86)
				HR45N (20 to 77)
				HR15T (67 to 93)
				HR30T (29 to 82)
		Micro Vicker's Hardness	IS 1501 (Part 1):2013	50 to 800 HV 0.01
				50 to 800 HV 0.3
	50 to 800 HV 0.5			
	50 to 800 HV 1			
	Bend	IS 1599:2012 (RA 2015)	Qualitative (Mandrel Diameter 2.0 mm to 160 mm Angle 180°)	
2.	Steel (Tubes/ Pipes)	Flattening	IS 2328:2005 (RA 2011)	Qualitative (8 mm to 50 mm Diameter)
		Drift Expansion	IS 2335:2005 (RA 2011)	Qualitative (8 mm to 90 mm outside Diameter & 0.2 mm to 6 mm Thick)
3.	Reinforcement	Weight per meter	IS 1786:2008 (RA 2013)	0.004 kg to 30.000 kg

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	Bar	Bend & Rebend	IS 1786:2008 (RA 2013)	Qualitative (Mandrel Diameter: 2.0 mm to 160 mm Angle 157.5°)
II.	METALLOGRAPHY TEST			
1.	Metals & Alloys (Steel, Castings, Aluminum, Copper)	Evaluation of Microstructure	ASM Hand book- Volume - 9 - Metallography & Microstructure, 2004	Qualitative (100X, 200X, 500X, 1000X)
	Ferrous Materials	Determination of Non Metallic Inclusion Rating by comparison method (TYPE "A")	IS 4163:2004 RA 2010 ASTM E-45 : 2013	Qualitative (Inclusion Rating Type A, B, C & D, 0.5 to 3.0, Thin/ Thick at 100x Magnification)
		Depth of Decarburisation	IS 6396:2000 (RA 2012) ASTM E1077-14	0.01 to 1.00 mm (100X)
		Estimation of Grain Size By Microscopic Method	IS 4748:2009 ASTM E112-2012	Qualitative (Grain Size No. 1 to 10 at 100X)
2.	Coated Materials	Measurement of Coating Thickness By Microscopy	ASTM B 487-85 (RA 2013)	0.01 mm to 1.00 mm (100 X)
3.	S.G & Grey Cast Iron	Nodularity, Microstructure & Graphite size	IS 7754:1975 (RA 2009) ASTM A 247:2017	Qualitative (100X)
4.	Ferrous Materials	Determination of Case Depth By Microscopic Method	IS 6416:1988 (RA 2012)	0.01 mm to 1.00 mm (100 X)
		Macroetching	ASTM E 340-2015	Qualitative
		Effective Case Depth	IS 6416:1988 (RA 2012)	0.1 mm to 6.0 mm at HV0.3
				0.1 mm to 6.0 mm at HV0.5

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				0.1 mm to 6.0 mm at HV1
III.	PLASTIC AND RUBBER TESTING			
1.	Natural Rubber Products & Synthetic Rubber Products	Tensile Property	IS 3400 (Part 1): 2012	10 N/mm ² to 800 N/mm ²
		Hardness	IS 3400 (Part 23): 2002 (RA 2012)	20 Shore A to 100 Shore A
		After Accelerated Aging	IS 3400 (Part 1): 2012	
		Change in Tensile Strength		2.0 % to 50.0 %
		Change in Elongation		1.0 % to 50.0 %
		Change in Hardness		1 Shore A to 20 Shore A
2.	Plastic Raw & Finished Products	Tensile Properties	IS 13360 (Part 5 & Section 1) : 1996 (RA 2013)	10 N/mm ² to 2500 N/mm ²
		Hardness	ASTM D 2240: 15 IS 13360 (Part 5 & Section 11) : 2013	20 Shore D to 100 Shore D
		Determine the izod pendulum impact resistance of Plastic	ASTM D 256:10	1 J/m to 25 J/m
		Compression Property of rigid plastic	ASTM D 695: 15	1 kg to 5000 kg
		Melt flow rate of thermoplastic or melt flow index	ASTM D 1238: 13, IS 13360 (Part 4 & Section 1): 2000 (RA 2013)	(0.10 gm to 10 gm)/ 10 Min
IV.	PAPER & PAPER PRODUCTS			
1.	Paper	Grammage	ASTM D 646: 13	30 g/m ² to 500 g/m ²
		Tensile Strength, elongation at break and Tensile Index	ASTM D 828: 16	1 N/mm ² to 100 N/mm ²
2.	Cardboard (Excluding Corrugated)	Grammage	ASTM D 646: 13	30 g/m ² to 1000 g/m ²
		Tensile Strength, elongation at break and	ASTM D828: 16	1.0 N/mm ² to 100 N/mm ²

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	Board)	Tensile Index		