

Laboratory

Sukhakarta General Engineering Cluster Pvt. Ltd., Plot No. 51, D1 Block, MIDC Chinchwad, Pune, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-6097

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Validity 10.08.2017 to 09.08.2019

Last Amended on 10.10.2018

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.	<b>Ferrous and Non-Ferrous Metals, Alloy &amp; Products</b> a) Die Steel	Carbon	JIS G 1253	0.50 % to 2.00 %
		Manganese		0.10 % to 0.50 %
Silicon		0.10 % to 0.50 %		
Sulphur		0.0005 % to 0.050 %		
Phosphorus		0.010 % to 0.050 %		
Chromium		3.00 % to 13.00 %		
Molybdenum		0.50 % to 1.00 %		
Vanadium		0.50 % to 1.50%		
Tungsten		0.010 % to 20.00%		
Cobalt		0.010 % to 5.50 %		
b) Alloy steel  Iron base(Fe) Plain carbon and Low alloy Steel	Carbon	ASTM E 415 IS 8811	0.010 % to 1.50 %	
	Manganese		0.050 % to 2.50 %	
	Silicon		0.0050 % to 2.50 %	
	Sulphur		0.0010 % to 0.35 %	
	Phosphorus		0.0020 % to 0.080 %	
	Chromium		0.050 % to 2.50 %	
	Nickel		0.010 % to 4.00 %	
	Molybdenum		0.0050 % to 0.30 %	
	Vanadium		0.010 % to 0.20 %	
	Aluminium		0.0020 % to 0.25 %	
	Niobium		0.0020 % to 0.15 %	
	Copper		0.010 % to 0.35 %	
	Titanium		0.0005 % to 0.10 %	
	Cobalt		0.010 % to 0.25 %	
	Boron		0.00010 % to 0.015%	
Tungsten	0.0050 % to 1.50 %			
Lead	0.020 % to 0.35 %			
Tin	0.0050 % to 0.025%			
Nitrogen	0.0010 % to 0.010%			

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	<b>c) Stainless Steel Iron base(Fe)-Stainless Steel</b>	Carbon	ASTM E 1086 IS 9879	0.0050 % to 0.15%
		Manganese		0.10 % to 2.50 %
		Silicon		0.10 % to 1.00 %
		Sulphur		0.0010 % to 0.030 %
		Phosphorus		0.0010 % to 0.080 %
		Chromium		10.00 % to 28.00%
		Nickel		0.10 % to 32.00 %
		Molybdenum		0.010 % to 8.00 %
		Vanadium		0.010 % to 0.15 %
		Aluminium		0.0010 % to 0.10 %
		Copper		0.0050 % to 4.00 %
		Nitrogen		0.0050 % to 0.35 %
		Titanium		0.0010 % to 0.55 %
		Niobium		0.0020 % to 0.40%
Cobalt	0.0010 % to 0.20%			
Tungsten	0.010 % to 0.10%			
2.	<b>a) Aluminium and Its Alloy Aluminum base(Al)</b>	Copper	ASTM E 1251 IS 11035	0.0010 % to 5.50 %
		Silicon		0.010 % to 12.00%
		Iron		0.030 % to 2.50 %
		Magnesium		0.0010 % to 3.50%
		Zinc		0.0080 % to 6.00%
		Manganese		0.0010 % to 0.50 %
		Chromium		0.0010 % to 0.50%
		Nickel		0.0010 % to 2.00 %
		Titanium		0.0010 % to 0.35 %
		Lead		0.0010 % to 0.30 %
		Tin		0.0001 % to 0.25 %
		Vanadium		0.0020 % to 0.050 %
		Strontium		0.0010 % to 0.050%

K. Siribabu  
Convenor

Jitendra B Vispute  
Program Manager

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3.	a) Copper and Its Alloy Copper base (Cu)	Zinc	TP/5.4/17 Issue No. 01 Issue Date: 21/09/2016 Rev. No. 00 Rev. Date: --	0.0050 % to 45.00%
		Iron		0.0010 % to 5.50 %
		Nickel		0.0030 % to 30.00 %
		Lead		0.0020 % to 4.50 %
		Tin		0.010 % to 10.50%
		Manganese		0.0005 % to 2.00 %
		Aluminium		0.0010 % to 8.00 %
		Phosphorus		0.0010 % to 0.35 %
		Sulphur		0.0010 % to 0.10 %
		Silicon		0.0010 % to 1.00 %
		Bismuth		0.0010 % to 0.15 %
		Arsenic		0.0010 % to 0.20 %
		Chromium		0.0050 % to 2.00 %
		Silver		0.0010 % to 0.55 %
Antimony	0.0010 % to 0.15 %			
Cobalt	0.010 % to 0.50 %			
Niobium	0.0050 % to 0.45%			
4.	a) Nickel and Its Alloy Nickel base (Ni)	Carbon	TP/5.4/18 Issue No. 01 Issue Date: 21/09/2016 Rev. No. 00 Rev. Date: --	0.010 % to 0.12 %
		Manganese		0.0001 % to 2.00 %
		Silicon		0.020 % to 1.00 %
		Sulphur		0.0010 % to 0.020%
		Phosphorus		0.0010 % to 0.020%
		Chromium		0.050 % to 25.00%
		Molybdenum		1.00 % to 12.00%
		Iron		0.010 % to 20.00%
		Aluminium		0.020 % to 1.00 %
		Niobium		0.010 % to 7.50 %
		Copper		0.010 % to 35.00 %
		Titanium		0.010 % to 0.75 %
		Cobalt		0.020 % to 0.60 %
		Nitrogen		0.005 % to 0.10 %
Tantalum	0.010 % to 0.10 %			

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5.	a) Zinc and Its Alloy Zinc base (Zn)	Lead	TP/5.4/19 Issue No. 01 Issue Date: 21/09/2016 Rev. No. 00 Rev. Date: --	0.0050 % to 0.30%
		Aluminium		0.010 % to 5.00 %
		Cadmium		0.0010 % to 0.10 %
		Magnesium		0.010 % to 0.035%
		Tin		0.0050 % to 0.20%
		Iron		0.0050 % to 0.030%
		Copper		0.0050 % to 0.10%
		Chromium		0.0010 % to 0.0035%
		Nickel		0.0010 % to 0.030%
		Antimony		0.0010 % to 0.0050%
		Manganese		0.0010 % to 0.025%

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<b><u>MECHANICAL TESTING</u></b>				
<b>I.</b>	<b>MECHANICAL PROPERTIES OF METALS</b>			
1.	<b>Ferrous and Non-Ferrous Metals, Alloy &amp; Products</b>	Rockwell Hardness	IS 1586 (Part 1)	20 HRA to 88 HRA 20 HRB to 100 HRB 20 HRC to 70 HRC
		Vickers Hardness	IS 1501 (Part 1)	100 HV to 850 HV(5) 100 HV to 850 HV(10) 100 HV to 850 HV(30)
		Micro-Vickers Hardness	IS 1501 (Part 1)	100 HV to 1000 HV (0.1) 100 HV to 1000 HV (0.3) 100 HV to 1000 HV(0.5) 100 HV to 1000 HV(1)
		Brinell Hardness	IS 1500 (Part 1)	100 HBW to 600 HBW (5mm/750kgf) 100 HBW to 600 HBW (10mm/3000kgf)
		Bend Test	IS 1599	Qualitative (Mandrel diameter: 0.5, 0.8, 1, 1.6, 2, 3, 6, 8, 10, 16, 18, 22, 32, 40, 50, 60, 75 mm.)
		Ultimate Tensile Strength	IS 1608	5 kN to 400 kN
		Yield Stress		5 kN to 400 kN
		Proof Stress		5 kN to 400 kN
		Elongation		1% to 95%
		Reduction in area		1% to 95%
		Charpy Impact Test U-notch	IS 1499	5 J to 300 J
Izod Impact Test	IS 1598	5 J to 170 J		
2.	<b>Ferrous and Non-Ferrous Sheets and Strips</b>	Cupping Test	IS 10175	Qualitative (Thickness:0.2 to 2.0 mm, Cupping: 1 to 20 mm)

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3.	Ferrous and Non-Ferrous Tubes and Pipes.	Flattening Flaring Test/ Drift Expansion	IS 2328 IS 2335	OD 600 mm max. Qualitative (Cone angle 60 deg / ID 30 to 60 mm, Cone angle 90 deg / ID 25 to 70 mm)
II.	<b>METALLOGRAPHY TEST</b>			
1.	Carbon and low alloy steel	Average Grain Size -by Comparison Metho D -Plate I – Untwined Grain	IS 4748 ASTM E112	Grain size: 00 to 10. (Magnification 100X)
2.	Electroplated and Anodized Coating on metals.	Coating Thickness - Microscopic Method	IS 3203 IS 5523	0.01 mm to 2.0 mm (Magnification 50 & 100X)
3.	Case Hardening on Metals	Case Depth -by Micro-Hardness Method	IS 6416	0.1 mm to 2 mm,
4.	Ferrous Metal, Alloys and Products	Depth of Decarburization -by Microscopic Method	IS 6396	0.01 mm to 2.0 mm (Magnification 50 & 100X)
5.	Weld in Metals (Butt and Fillet weld)	Imperfections -dimensional measurements	ISO 5817	Length 0.1 to 20 mm. (Magnification: 7.5X to 60X)