

Laboratory **Microlab, No. 10A, RMT Bunglow Road, Sai Nagar 2nd Cross, SIDCO Industrial Estate, Coimbatore, Tamil Nadu**

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

Certificate Number **TC-5848**

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Validity **03.12.2017 to 02.12.2019**

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.	Ferrous Base (Plain carbon & Low Alloy Steels)	Aluminium	IS 8811:1998 (RA 2012)	0.003 % to 0.10 %
		Boron	ASTM E415-2017	0.001 % to 0.01 %
		Carbon		0.010 % to 1.50 %
		Chromium		0.070 % to 5.00 %
		Copper		0.035 % to 0.50 %
		Manganese		0.01 % to 2.00 %
		Molybdenum		0.015 % to 1.50 %
		Nickel		0.067 % to 5.00 %
		Niobium		0.001 % to 0.05 %
		Nitrogen		0.005 % to 0.04 %
		Phosphorous		0.006 % to 0.10 %
		Silicon		0.05 % to 2.00 %
		Sulphur		0.004 % to 0.30 %
		Tungsten		0.002 % to 1.03 %
Vanadium		0.003 % to 1.00 %		
2.	Ferrous Base (Stainless Steel)	Aluminium	ASTM E 1086:2014	0.004 % to 0.033 %
		Carbon	IS 9879:1998 (RA 2009)	0.010 % to 1.50 %
		Chromium		8.000 % to 26.35 %
		Copper		0.078 % to 3.57 %
		Manganese		0.200 % to 12.00 %
		Molybdenum		0.100 % to 6.00 %
		Nickel		0.200 % to 35.00 %
		Phosphorus		0.009 % to 0.08 %
		Silicon		0.200 % to 3.00 %
		Sulphur		0.010 % to 0.35 %
		Cobalt		0.020 % to 0.28 %
		Niobium		0.003 % to 0.65 %
		Nitrogen		0.009 % to 0.32 %
Titanium		0.001 % to 1.11 %		

Sachin Tomar
Convenor

N. Venkateswaran
Program Director

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		Tungsten		0.003 % to 1.03 %
		Vanadium		0.02 % to 0.21 %
3.	Aluminum Base Alloys	Bismuth	ASTM E 1251:2011	0.007 to 0.10 %
		Chromium		0.004 to 0.20 %
		Copper		0.035 to 5.50 %
		Iron		0.20 to 0.50 %
		Lead		0.006 to 0.60 %
		Magnesium		0.070 to 5.50 %
		Manganese		0.010 to 1.20 %
		Nickel		0.010 to 2.00 %
		Silicon		0.10 to 15.00 %
		Tin		0.02 to 0.50 %
		Titanium		0.080 to 0.31 %
		Vanadium		0.008 to 0.022 %
		Zinc		0.010 to 5.00 %
4.	Copper Base Alloys	Aluminium	BS EN 15079:2015	0.002 to 12.00 %
		Antimony		0.002 to 0.10 %
		Arsenic		0.004 to 0.10 %
		Iron		0.010 to 4.00 %
		Lead		0.002 to 9.50 %
		Manganese		0.001 to 3.00 %
		Nickel		0.36 to 34.45 %
		Phosphorous		0.0023 to 0.20 %
		Silicon		0.001 to 3.55 %
		Sulphur		0.002 to 0.030 %
		Tin		0.002 to 15.00 %
		Zinc		0.085 to 41.80 %
		5.		Nickel Base Alloys
Carbon	0.004 to 0.15 %			
Chromium	0.007 to 30.00 %			
Cobalt	0.017 to 10.00 %			
Copper	0.01 to 35.00 %			
Iron	1.00 to 40.00 %			

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		Manganese		0.090 % to 1.50 %
		Molybdenum		0.018 % to 27.30 %
		Niobium		0.003 % to 5.88 %
		Phosphorus		0.01 % to 0.022 %
		Sulphur		0.001 % to 0.030 %
		Silicon		0.01 % to 2.00 %
		Titanium		0.002 % to 1.50 %
		Tungsten		0.01 % to 5.00 %
		Vanadium		0.002 % to 0.23 %
6.	Ferrous Base (Cast Iron & SG Iron)	Carbon	ASTM E 1999:2011	1.90 % to 3.80 %
		Manganese		0.10 % to 1.00%
		Phosphorous		0.005 % to 0.90 %
		Silicon		0.15 % to 3.00 %
		Sulphur		0.007 % to 0.07 %

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Ferrous and Non Ferrous Metals	Tensile Test		
		Tensile Strength (UTS)	IS 1608-2005 (RA 2010) ASTM A 370-2017 ASTM E 8/ E8M-2016a	1 to 950 kN
		Yield Strength (0.2% PS)	ASTM B 557M -2015 ISO 6892-1:2016 EN ISO 4136-2013 BS EN 13458-2-2002 IS 7307-1- 1974 (RA 2003)	
		% Elongation	IS 2825:1969	1 % to 75 %
		% Reduction in area	IS 1786:2008 (RA 2013)	1 % to 75 %
		Bend Test	IS 1599 (RA 2012) ASTM A370-2017 IS 1786-2008 ISO 7438-2016	Mandrel Diameter 05 mm, 10 mm, 16 mm, 20 mm, 24 mm, 30 mm, 38 mm, 40 mm
		Hardness Test		
		Rockwell Hardness	IS 1586-part -1-(Ra2017) ASTM E18-2016 ASTM A 370-2017 ISO 6508-1-2016	40 HRB to 100 HRB 20 HRC to 70 HRC 20 HRA to 88 HRA
		Vickers Hardness	IS 1501-1-2013 ISO 6507-1-2005 ASTM E 92-2016 ISO 9015-1: 2011	100 HV to 800 HV (1 HV to HV 30)
		Brinell Hardness Test	IS 1500-1-2013 ASTM E 10-2017 ISO 6506-1-2014	100 HBW to 600 HBW (Load:187.5 to 3000 Kgs) (Dia: 2.5,5,10 mm)
	Micro Vickers Hardness Test	IS 1501-2013 ASTM E384-2016	100 HV to 1200 HV (100 gf to 1000 gf)	

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			ASTM E92-2016 ISO 9015-1-2011 ISO 6507-1-2005	
		Charpy Impact Test	ISO 148-1-2016 IS 1757-1-2014 IS 1499-1977 (RA 2009) EN ISO 9016-2012	4 J to 240 J (Ambient to -196 °C)
			ASTM E23-2016 ASTM A923-2014 Mtd B	4 J to 240 J (Ambient to -196 °C)
		Izod Impact Test	IS 1598 (1977) Ra 2015	5 J to 164 J
2.	Ferrous and Non Ferrous Weld Joints	Transverse Tensile Test	ASME SEC IX -2015 (QW 150, QW 462) AWS D1.1-2015	1 kN to 950 kN
		Transverse Bend Test Root Bend Face Bend Side Bend	BS EN ISO 15614-1-2012 EN ISO 5173-2012 IS 7307-1-1974 (RA 2003) IS 2825-1969 AWS D1.6-2007 AWS D1.3-2008 AWS D1.6-2007 IS 7307-1-1974 (RA 2003) ISO 9017-2013	Qualitative Mandrel Diameter (05 mm, 10 mm, 16 mm, 20 mm, 24 mm, 30 mm, 38 mm, 40 mm)
		Fracture Test	IS 7307-1-1974 (RA 2003) ISO 9017-2013	Qualitative
		Charpy Impact Test	ISO 148-1-2016 ASTM E23 - 2016	4 J to 240 J (Ambient to -196 °C)
II.	METALLOGRAPHY TEST			
1.	Ferrous and Non ferrous: Billets, Blooms, Hot Rolled products, Forgings,	Macro Examination	IS 13015:1991 (RA 2012) IS 11371:1985 (RA 2012) ASM Hand Book Vol. 9 - 2004 ASME SEC IX – 2015	Upto 20X

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	Extrusion, Sheets, Plates, Weldments, Castings, Machined and ground parts		ASTM E340 – 2015 ASTM E381 – 2017 EN 1321 – 1997 IS 7307:1 :1974 (Ra 2008) EN ISO 17639 (2013)	
2.	Metals and Alloys	Micro Examination	IS 7739 (Part III) – 1976 (Ra 2012) ASM Metals Hand Book vol.9-2004 ASTM E407 -07(Ra 2015) ASTM E3-2017 ASTM A923 - 2014	50X to 1000X
3.	Steel and Stainless Steel	Inclusion Rating	IS 4163-2004(Ra2010) ASTM E 45-2013 BS EN10247-2007	Thin 0.5 to 3.0 Thick 0.5- 3.0 (Mag 100X)
		Grain size Measurements by Comparison Method	ASTM E112 -2013 IS 4748-2009 EN ISO 643-2012	Grain size No: 1 to 10 (Qualitative) (Mag 100X)
		Decarburization Depth	ASTM E 1077-2014 IS 6396-2000 (RA 2012) ISO 1083-2004	20 microns to 1mm
4.	Grey Cast Iron & S.G. Iron Products	Micro Examination, Graphite Flakes/ Nodules type and size, distribution characteristics and matrix analysis	IS 7754 - 1975 (Ra 2012) ISO 945-1:2008 ISO 1083-2004 ASTM A247-2016a ASM Metal Hand Book Vol.9 2004	Mag 50X to 1000X
5.	Duplex Stainless Steels	Determination of Volume fraction of phase	ASTM E562-2011	5 % to 95 %
6.	Case hardened Steels & Nitrided Steels	Case depth by Hardness Traverse method & Metallography	IS 6416-1988(Ra 2012) ISO 2639 – 2002 IS 13691 - 1993 (Ra 2012) ISO 18203-2016	0.05 - 10mm (HV 0.2, HV 0.3) 20 microns - 0.3mm

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7.	Stainless Steel – Wrought / Cast Products	Intergranular Corrosion Test	ASTM A262-2015 Practice-A Practice-B Practice-C Practice-E ISO 3651-1:1998	Qualitative 0.001 mpy to 220 mpy 0.001 mpy to 220 mpy Qualitative Qualitative
8.	Stainless Steel & Duplex Stainless Steel	Pitting Corrosion Test	ASTM G28 (RA2015) ISO 3651-2 (1998) ASTM G-48 – Ra2015 Method A Method B ASTM A923 – 2014 Method C	Up to 220g