

Laboratory **Parth Metallurgical Services, Plot-B-15/16, MIDC, Hingna Road, Nagpur, Maharashtra**

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

Certificate Number **TC-5451**

Page 1 of 5

Validity **26.10.2017 to 25.10.2019**

Last Amended on **21.12.2018**

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.	Plain Carbon and Low alloy Steel	Carbon	IS 8811:1998-(RA 2018) ASTM E 415-17	0.005 % to 1.2 %
		Sulphur		0.005 % to 0.06 %
		Phosphorous		0.004 % to 0.07 %
		Silicon		0.003 % to 0.5 %
		Manganese		0.1 % to 1.6 %
		Copper		0.007 % to 0.4 %
		Molybdenum		0.001 % to 0.4 %
		Nickel		0.01 % to 0.75 %
		Chrome		0.005 % to 2.2 %
		Vanadium		0.0005 % to 0.25 %
		Aluminum		0.008 % to 0.1 %
		Titanium		0.0004 % to 0.25 %
		Niobium		0.01 % to 0.05 %
		Boron		0.001 % to 0.007 %
		Cobalt		0.004 % to 0.025 %
		Nitrogen		0.002 % to 0.015 %
		Tungsten		0.02 % to 0.04 %
2.	Stainless Steel	Carbon	IS 9879:1998 (RA 2015) ASTM E1086-2014	0.008 % to 0.25 %
		Sulphur		0.001 % to 0.050 %
		Phosphorous		0.005 % to 0.04 %
		Silicon		0.05 % to 1.4 %
		Manganese		0.05 % to 15 %
		Copper		0.08 % to 2.5 %
		Molybdenum		0.005 % to 0.4 %
		Nickel		0.2 % to 40 %
		Chrome		8.0 % to 25.0 %
		Vanadium		0.05 % to 0.15 %
		Aluminum		0.007 % to 0.08 %

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Page 2 of 5

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		Titanium		0.002 % to 1.15 %
		Cobalt		0.01 % to 0.1 %
		Niobium		0.01 % to 0.30 %
		Nitrogen		0.002 % to 0.40 %
		Boron		0.0007 % to 0.003 %
3.	Copper alloys	Zinc	BSEN 15079 : 2015	4.0 % to 33.0 %
		Lead		0.08 % to 4.5 %
		Tin		1.0 % to 6.0 %
		Phosphorous		0.030 % to 0.25 %
		Manganese		0.010 % to 0.15 %
		Iron		0.10 % to 0.40 %
		Nickel		0.02 % to 2.00 %
		Silicon		0.050 % to 0.20 %
		Arsenic		0.020 % to 0.070 %
		Antimony		0.04 % to 0.30 %
		Bismuth		0.04 % to 0.10 %
		Silver		0.01 % to 0.05 %
		Aluminium		0.03 % to 0.15 %
		Sulphur		0.001 % to 0.12 %
4.	Aluminium alloys	Silicon	ASTM E1251-2014	0.20 % to 10.0 %
		Iron		0.10 % to 0.50 %
		Copper		0.04 % to 0.06 %
		Manganese		0.010 % to 0.2 %
		Magnesium		0.35 % to 0.75 %
		Chromium		0.010 % to 0.070 %
		Nickel		0.007 % to 0.060 %
		Zinc		0.04 % to 0.120 %
		Titanium		0.01 % to 0.350 %
		Lead		0.015 % to 0.025 %
		Vanadium		0.010 % to 0.015 %

Malancha Das
Convenor

Nitan Garg
Program Manger

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Page 3 of 5

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	(Ferrous, Non ferrous alloys & Products)	Brinell Hardness 10/3000 5/750	IS 1500, (Part I):2013 ISO 6506-1:2014	100 to 550 HBW
		Rockwell Hardness	IS 1586, (Part I):2012 ISO 6508-1:2017	20 to 88 HRA 20 to 100 HRBW 20 to 70 HRC
2.	Ferrous, Non ferrous alloys, Re-enforcement bars; Weldment & products	Tensile strength (UTS), Yield Strength, 0.2% Proof Stress, Elongation, Reduction in area	IS 1608:2005 (RA 2011) ISO 6892-1:2016 ASTM E 8:2016a IS 1786:2008 (RA 2013) ASME BPVC-IX:2017	50 to 1700 N/mm ² 50 to 1700 N/mm ² 50 to 1700 N/mm ² 2% to 80% 2% to 80%
3.	Ferrous, Non ferrous alloys, Re-enforcement bars; Weldment	Bend test & Re-bend test	IS 1599:2012 (RA 2013), ASME BPVC-IX:2017 IS 1786:2008 (RA 2013) ISO 7438:2017 ASTM E 290:2014	Qualitative (Mandrel Diameter 6,8, 12, 16, 24, 32, 36, 40, 44, 48, 64, 80 & 125mm)
4.	Ferrous Metals (Steel Pipes and Tubes)	Flattening test	IS 2328:2005 (RA 2011) ISO 8492:2013	Qualitative (Outer Diameter upto 400 mm Max)
5.	Ferrous & non ferrous metals and alloys	Charpy Impact test "V" notch	As per Test Method QI/LAB/05 (Based on IS 1757 (Part 1): 2014	1 to 300 J, Ambient temperature to (-) 60°C

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Page 4 of 5

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II.	METALLOGRAPHY TEST			
1.	Ferrous & non ferrous metals, alloys & Products	Micro structural analysis	ASM Metal handbook Vol. 9:2004, IS 7739 (Part I):1975 (RA 2010), IS 7739 (Part III):1975 (RA 2007), IS 7739 (Part IV):1975 (RA 2007), IS 7739 (Part V):1976 (RA 2007), ASTM E 407:2007	Qualitative (Magnification range 100X, 200X, 500X & 1000X)
2.	Cast Iron & Products	Type, size & distribution of graphite flakes & nodules	IS 7754:1975, (RA 2003)	Qualitative (Magnification range 100X, 200X, 500X & 1000X)
3.	Ferrous Metals, alloys & Products	Estimation of Grain Size by comparison method	IS 4748:2009 ISO 643:2012 ASTM E 407:2007/ ASTM E 112:2013	Qualitative Grain size No.1 to 10 (Magnification 100X)
		Macro structural analysis	IS 11371:1985 (RA 2007) IS 13015:1991 (RA 2012) ASTM E 340:2015/ ASTM E-381-2017	Visual examination by 7x / 20x Qualitative
4.	Steels	Inclusion rating A to D by microscopic method	IS 4163:2004 (RA 2010) ISO 4967:2013 ASTM E 45 (Method A):2013	Qualitative Inclusion rating: 0.5 to 3.0 Range Thin / Heavy Magnification 100X
		Estimating depth of Decarburization by microscopic method	IS 6396:2000 (RA 2012) ASTM E 1077-01:2014	0.01 to 1.0 mm Magnification 100X
		Case Depth Measurement by Microscopic Method & by Macrostructure Method	IS 6416:1988 (RA 2012)	Magnification 100X 0.01 to 1.0mm 1.0 to 5.0 mm

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Page 5 of 5

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