Laboratory	**Chemical and Metallurgical Services, T.S. 63 A, Sidco Industrial Estate, Ekkduthangal, Chennai, Tamil Nadu**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Discipline	**Chemical Testing**	**Issue Date**	**13.12.2014**
Certificate Number	**T-0475**	**Valid Until**	**12.12.2016**
Last Amended on	**-**	**Page**	**1 of 8**

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I.	**METALS & ALLOYS**			
1.	**Plain carbon steel**	Carbon	IS 8811: 1998	0.005 % to 2 %
		Silicon		0.005 % to 3.5 %
		Manganese		0.005 % to 3 %
		Phosphorus		0.001 % to 0.9 %
		Sulphur		0.001 % to 0.6 %
		Copper		0.005 % to 2 %
		Lead		0.005 % to 2.5 %
2.	**Low alloy steel**	Carbon	IS 8811: 1998	0.005 % to 2 %
		Silicon		0.005 % to 3.5 %
		Manganesse		0.005 % to 5 %
		Phosphorus		0.001 % to 0.9 %
		Sulphur		0.001 % to 0.6 %
		Chromium		0.005 % to 8 %
		Nickel		0.005 % to 5 %
		Molybdenum		0.005 % to 5 %
		Copper		0.005 % to 3 %
		Aluminium		0.005 % to 3 %
		Vanadium		0.005 % to 5 %
		Lead		0.005 % to 2.5 %
		Titanium		0.005 % to 2 %
		Boron		0.0003 % to 0.1 %
		Nitrogen		0.005 % to 0.1 %
		Arsenic		0.005 % to 0.15 %

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3.	**High alloy steel**	Carbon	IS 9879:1998	0.005 % to 3.5 %
		Silicon		0.005 % to 4 %
		Manganese		0.005 % to 20 %
		Phosphorus		0.001 % to 0.9 %
		Sulphur		0.001 % to 0.6 %
		Chromium		0.01 % to 14 %
		Copper		0.005 % to 4 %
		Vanadium		0.005 % to 5 %
		Titanium		0.005 % to 2 %
4.	**Stainless steel**	Carbon	IS 9879:1998	0.005 % to 1.5 %
		Silicon		0.005 % to 3.5 %
		Manganese		0.005 % to 3 %
		Phosphorus		0.001 % to 0.9 %
		Sulphur		0.001 % to 0.6 %
		Chromium		5.00 % to 30 %
		Nickel		5.00 % to 25 %
		Molybdenum		0.005 % to 8 %
		Lead		0.005 % to 2.5 %
		Titanium		0.005 % to 2 %
		Copper		0.005 % to 3 %
		Alumimium		0.005 % to 3 %
		Vanadium		0.005 % to 5 %
		Niobium		0.005 % to 1.5 %
		Nitrogen		0.005 % to 1 %

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5.	**Tool steel**	Carbon	IS 9879:1998	0.005 % to 3 %
		Silicon		0.005 % to 3.5 %
		Manganese		0.005 % to 5 %
		Phosphorus		0.001 % to 0.9 %
		Sulphur		0.001 % to 0.6 %
		Chromium		0.005 % to 10 %
		Nickel		0.005 % to 7 %
		Molybdenum		0.005 % to 8 %
		Copper		0.005 % to 3 %
		Vanadium		0.005 % to 7 %
		Cobalt		0.005 % to 12 %
		Tungsten		0.01 % to 22 %
6.	**Cast Iron**	Carbon	IS 15338: 2003	0.005 % to 5 %
		Silicon		0.005 % to 4 %
		Manganese		0.005 % to 5 %
		Phosphorus		0.001 % to 1 %
		Sulphur		0.001 % to 1 %
		Chromium		0.005 % to 7 %
		Nickel		0.005 % to 7 %
		Molybdenum		0.005 % to 6 %
		Copper		0.005 % to 2.2 %
		Lead		0.005 % to 2.5 %
		Titanium		0.002 % to 1.5 %

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Cast Iron	Tin	IS 15338: 2003	0.04 % to 0.2 %
		Magnesium		0.005 % to 0.15 %
7.	**Aluminium & Aluminium Base Alloys**	Copper	ASTM E1251-11	0.01 % to 15 %
		Silicon		0.015 % to 20 %
		Magnesium		0.015 % to 13 %
		Zinc		0.015 % to 8 %
		Nickel		0.01 % to 1.5 %
		Manganese		0.015 % to1.5 %
		Tin		0.04 % to 0.5 %
		Iron		0.01 % to 2 %
		Lead		0.04 % to 0.5 %
		Titanium		0.005 % to 0.5 %
		Chromium		0.008 % to 0.5 %
		Phosphorous		0.003 % to 0.01 %
		Cobalt		0.015 % to 0.5 %
		Vanadium		0.01 % to 0.2 %
		Bismuth		0.01 % to 0.2 %
		Zirconium		0.0015 % to 0.5 %
		Beryllium		0.0001 % to 0.05 %

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8.	**Copper & Copper Base Alloys**	Tin	CMS/SOP/OES/Cu-2014	0.05 % to 13.05 %
		Lead		0.05 % to 25 %
		Zinc		0.05 % to 40 %
		Silicon		0.04 % to 1.5 %
		Aluminium		0.02 % to 12 %
		Magnesium		0.005 % to 0.05 %
		Nickel		0.05 % to 35 %
		Chromium		0.01 % to 1.7 %
		Manganese		0.02 % to 2 %
		Sulphur		0.008 % to 0.2 %
		Iron		0.02 % to 7 %
		Phosphorous		0.02 % to 1 %
		Antimony		0.02 % to 0.8 %
		Arsenic		0.1 % to 0.3 %
9.	**Nickel & Nickel Base Alloys**	Carbon	CMS/SOP/OES/Ni-2014	0.008 % to 0.3 %
		Manganese		0.02 % to 3.5 %
		Silicon		0.01 % to 4.2 %
		Iron		0.05 % to 50 %
		Copper		0.02 % to 35 %
		Aluminium		0.01 % to 7 %
		Cobalt		0.03 % to 4 %

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10.	**Stainless steel**	Carbon	IS 228 (Part 1): 1987	0.005 % to 0.5 %
		Silicon	IS 228 (Part 8): 1989	0.01% to 3 %
		Manganese	IS 228 (Part 2): 1987	0.01 % to 3 %
		Phosphorus	IS 228 (Part 3): 1987	0.005 % to 0.09 %
		Sulphur	ASTM E 350: 2001 & IS 228 (Part 9): 1989	0.005 % to 0.09 %
		Chromium	IS 228 (Part 6): 1987	5 % to 35 %
		Nickel	IS 228 (Part 5): 1987	5 % to 25 %
		Molybdenum	IS 228 (Part 7): 1990	0.01 % to 5 %
11.	**Alloy Steel and Plain Carbon steel**	Carbon	IS 228 (Part 1): 1987	0.005 % to 2.7 %
		Silicon	IS 228 (Part 8): 1989	0.01 % to 2.5 %
		Manganese	IS 228 (Part 2): 1987	0.01 % to 12 %
		Phosphorus	IS 228 (Part 3): 1987	0.005 % to 0.5 %
		Sulphur	ASTM E 350: 2001 & IS 228 (Part 9): 1989	0.005 % to 0.5 %
		Chromium	IS 228 (Part 6): 1987	0.01 % to 8 %
		Nickel	IS 228 (Part 5): 1987	0.01 % to 5 %
		Molybdenum	IS 228 (Part 7): 1987	0.01 % to 5 %

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
12.	**Cast Iron**	Carbon	IS 228 (Part 1): 1987	1 % to 5.5 %
		Silicon	IS 228 (Part 8): 1989	0.1 % to 3.8 %
		Manganese	IS 228 (Part 2): 1987	0.01 % to 2.5 %
		Phosphorus	IS 228 (Part 3): 1987	0.005 % to 1 %
		Sulphur	ASTM E 350: 2001 & IS 228 (Part 9): 1989	0.005 % to 1 %
		Chromium	IS 228 (Part 6): 1987	0.01 % to 4 %
		Nickel	IS 228 (Part 5): 1987	0.01 % to 4.5 %
		Molybdenum	IS 228 (Part 7): 1987	0.01 % to 4 %
13.	**Copper Base Alloys**	Copper	IS 4027 (Part 1): 1987 IS 3685: 1966 & CMS/SOP/ AAS-Cu	0.01 % to 99.9 %
		Lead	IS 4027 (Part 1): 1987 IS 3685: 1966 & CMS/SOP/ AAS-Cu	0.01 % to 15 %
		Tin	IS 4027 (Part 5): 1987 IS 3685: 1966	0.01 % to 15 %
		Zinc	IS 4027 (Part 6): 1987 IS 3685: 1966	0.01 % to 50 %
		Iron	IS 4027(Part 8): 1987 CMS/SOP/ AAS-Cu & IS 3685: 1966	0.01 % to 7 %

S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Copper Base Alloys	Aluminium	IS 3685: 1966 & ASTM E 54: 2001	0.01 % to 15 %
		Manganese	IS 3685: 1966 & CMS/SOP/ AAS-Cu	0.01 % to 6 %
		Phosphorus	IS 4027 (Part 3): 1987	0.005 % to 2 %
		Nickel	IS 3685: 1966	0.01 % to 19 %
14.	**Aluminium Base Alloys**	Silicon	IS 504 (Part 1): 2002 & CMS/SOP/AAS-Al	0.01 % to 13 %
		Copper	IS 504 (Part 3): 2002 ASTM E 34: 2001 & CMS/SOP/AAS-Al	0.01 % to 6 %
		Manganese	IS 504 (Part 5): 2002 & CMS/SOP/AAS-Al	0.01 % to 7 %
		Magnesium	IS 504 (Part 6): 2002 ASTM E 34: 2001 & CMS/SOP/AAS-Al	0.01 % to 6 %
		Iron	IS 504 (Part 2): 2002 & CMS/SOP/AAS-Al	0.01 % to 3 %
		Nickel	IS 504 (Part 7): 2002	0.01 % to 4 %
		Zinc	IS 504 (Part 4): 2002	0.01 % to 5 %

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