

Laboratory Sunbeam Auto Pvt. Ltd., Testing Research & Development Centre,
38/6 Km Stone, Delhi-Jaipur Highway, Narsingpur, Gurgaon, Haryana

Accreditation Standard ISO/IEC 17025: 2005

Discipline Chemical Testing **Issue Date** 01.11.2015

Certificate Number T-0326 **Valid Until** 31.10.2017

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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.	Iron & Steel (Plain Carbon Steel, Stainless Steel, Tool Steel)	By Wet Method		
		Carbon	IS 228 (Part 1,4): 2008	0.05 % to 4.5 %
		Manganese	IS 228 (Part 2): 2008, IS 12308 (Part 10): 2006	0.06 % to 10.0 %
		Silicon	IS 228 (Part 8): 2009	0.05 % to 6.0 %
		Sulphur	IS 228 (Part 9): 2009	0.010 % to 0.60 %
		Phosphorus	IS 228 (Part 3): 2008	0.010 % to 0.90 %
		Chromium	IS 228 (Part 6): 2009	0.01 % to 35.0 %
		Nickel	IS 228 (Part 5): 2009	0.01 % to 48.0 %
		Molybdenum	IS 228 (Part 10): 2009	0.01 % to 10.0 %
		Arsenic	IS 228 (Part 13): 2009	0.05 % to 0.10 %
		Copper	IS 228 (Part 15): 2009	0.03 % to 20.0 %
Tungsten	IS 228 (Part 16): 2009	0.02 % to 25.0 %		
Nitrogen	IS 228 (Part 19): 2010	0.02 % to 0.50 %		

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	Iron & Steel (Plain Carbon Steel, Stainless Steel, Tool Steel)	By OES		
		Carbon	ASTM E415: 2008	0.05 % to 4.5 %
		Manganese	ASTM E415: 2008	0.002 % to 20.0 %
		Silicon	ASTM E415: 2008	0.001 % to 6.0 %
		Sulphur	ASTM E415: 2008	0.001 % to 0.60 %
		Phosphorus	ASTM E415: 2008	0.001 % to 0.90 %
		Chromium	ASTM E415: 2008	0.003 % to 35.0 %
		Nickel	ASTM E415: 2008	0.003 % to 48.0 %
		Molybdenum	ASTM E415: 2008	0.002 % to 10.0 %
		Aluminium	ASTM E415: 2008	0.002 % to 5.5 %
		Arsenic	ASTM E415: 2008	0.002 % to 0.10 %
		Cobalt	ASTM E415: 2008	0.01 % to 20.0 %
		Copper	ASTM E415: 2008	0.002 % to 20.0 %
		Vanadium	ASTM E415: 2008	0.005 % to 7.5 %
		Tungusten	ASTM E415: 2008	0.002 % to 25.0 %
		Lead	ASTM E415: 2008	0.003 % to 0.50 %
		Tin	ASTM E415: 2008	0.001 % to 0.35 %
		Titanium	ASTM E415: 2008	0.002 % to 4.50 %

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	Iron & Steel (Plain Carbon Steel, Stainless Steel, Tool Steel)	Neobium	ASTM E415: 2008	0.001 % to 5.50 %
		Boron	ASTM E415: 2008	0.0003 % to 0.25 %
		Nitrogen	ASTM E415: 2008	0.003 % to 0.50 %
2. Ferro Alloys Ferro Silicon Ferro Manganese Ferro Chromium Ferro Vanadium	Main Element	Silicon	IS 1559 (Sec I): 2007	10 % to 75 %
	Manganese		IS 1559 (Sec III): 2007	65 % to 90 %
	Chromium		IS 1559 (Sec II): 2007	50 % to 90 %
	Vanadium		IS 1559 (Sec VIII): 2007	35 % to 90 %
3. Aluminium & Aluminium Base Alloys	By Wet Method	Copper	IS 504: 2002	0.02 % to 20.0 %
	Magnesium		IS 504: 2002	0.01 % to 15.0 %
	Silicon		IS 504: 2002	0.05 % to 30.0 %
	Iron		IS 504: 2002	0.02 % to 3.0 %
	Manganese		IS 504: 2002	0.01 % to 2.0 %
	Nickel		IS 504: 2002	0.02 % to 4.0 %
	Zinc		IS 504: 2002	0.01 % to 12.0 %
	Tin		IS 504: 2002	0.03 % to 1.0 %
	Titanium		IS 504: 2002	0.01 % to 0.30 %
Chromium		IS 504: 2002	0.02 % to 1.0 %	

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S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Aluminium & Aluminium Base Alloys	By FAAS/GFAAS/HG-Copper	ASTM E34: 1994	0.001 % to 10.0 %
		Magnesium	ASTM E34: 1994	0.001 % to 10.0 %
		Iron	ASTM E34: 1994	0.002 % to 3.0 %
		Manganese	ASTM E34: 1994	0.001 % to 2.0 %
		Nickel	ASTM E34: 1994	0.001 % to 4.0 %
		Lead	ASTM E34: 1994	0.005 % to 1.0 %
		Chromium	ASTM E34: 1994	0.002 % to 1.0 %
		By OES Copper	ASTM E1251: 2011	0.01% to 20.0 %
		Magnesium	ASTM E1251: 2011	0.001 % to 15.0 %
		Silicon	ASTM E1251: 2011	0.001 % to 30.0 %
		Iron	ASTM E1251: 2011	0.002 % to 3.0 %
		Manganese	ASTM E1251: 2011	0.001 % to 2.0 %
		Nickel	ASTM E1251: 2011	0.001 % to 4.0 %
		Zinc	ASTM E1251: 2011	0.005 % to 12.0 %
		Lead	ASTM E1251: 2011	0.005 % to 1.0 %
		Tin	ASTM E1251: 2011	0.001 % to 1.0 %

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	Aluminium & Aluminium Base Alloys	Titanium	ASTM E1251: 2011	0.001 % to 0.30 %
		Chromium	ASTM E1251: 2011	0.002 % to 1.0 %
		Calcium	ASTM E1251: 2011	0.0005 % to 0.06 %
		Phosphorus	ASTM E1251: 2011	0.0005 % to 0.01 %
		Vanadium	ASTM E1251: 2011	0.004 % to 0.20 %
		Strontium	ASTM E1251: 2011	0.0005 % to 0.16 %
4.	Tin & Tin base Alloys	By Wet Method Tin	IS 998 (Part 1 to 3): 2008	1.0 % to 96.0 %
		Antimony	IS 999: 2008	0.10 % to 16.0 %
		Arsenic	IS 8097: 2010	0.001 % to 0.5 %
		Bismuth	IS 7255 (Part 1): 2009 IS 7255 (Part 2): 2009	0.001 % to 0.5 %
		Cadmium		0.01 % to 5.0 %
		Copper		0.005 % to 2.0 %
		Iron		0.005 % to 1.0 %
		Lead		0.10 % to 40.0 %
	Nickel		0.002 % to 0.5 %	

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5.	Copper & Copper Alloys	By Wet Method		
		Tin	IS 440: 2006, IS 4027 (Part 5): 2006	0.05 % to 20 %
		Lead	IS 3685:2006	0.05 % to 27 %
		Zinc	IS 440: 2006, IS 4027 (Part 1): 2006	0.05 % to 50 %
		Iron	IS 3685: 2000 IS 4027 (Part 6): 2006 IS 3685: 2000	0.05 % to 5.0 %
		Nickel	IS 440: 2006, IS 4027 (Part 8): 2003	0.05 % to 5.0 %
		Aluminium	IS 3685: 2000 IS 440: 2006, IS 4027 (Part 4): 2006	0.05 % to 13 %
		Silicon	IS 3685: 2000	0.05 % to 5 %
		Arsenic	IS 4027 (Part 9): 2003	0.005 % to 1.0 %
		Manganese	IS 3685: 2000 IS 4027 (Part 10): 2000 IS 3685: 2000	0.005 % to 6.0 %
		Bismuth	IS 440: 2006, IS 3685: 2000 IS 4027 (Part 2): 2006 IS 3685: 2000	0.05 % to 0.1 %

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	Copper & Copper Alloys	Phosphorus	IS 440: 2006 IS 4027 (Part 3): 2006 IS 3685: 2000	0.05 % to 1.2 %
		Silver	IS 4667: 1968	0.05 % to 0.1 %
		By OES Tin	BS EN 15079: 2015	0.001 % to 20 %
		Lead	BS EN 15079: 2015	0.005 % to 27 %
		Zinc	BS EN 15079: 2015	0.005 % to 50 %
		Iron	BS EN 15079: 2015	0.001 % to 5.0 %
		Nickel	BS EN 15079: 2015	0.001 % to 5.0 %
		Aluminium	BS EN 15079: 2015	0.001 % to 13 %
		Silicon	BS EN 15079: 2015	0.001 % to 5 %
		Arsenic	BS EN 15079: 2015	0.001 % to 1.0 %
		Manganese	BS EN 15079: 2015	0.001 % to 6.0 %
		Bismuth	BS EN 15079: 2015	0.001 % to 0.1 %
		Phosphorus	BS EN 15079: 2015	0.003 % to 1.2 %
		Chromium	BS EN 15079: 2015	0.005 % to 1.25 %
		Silver	BS EN 15079: 2015	0.001 % to 0.1 %
		Sulphur	BS EN 15079: 2015	0.002 % to 0.1 %

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	Copper & Copper Alloys	Beryllium	BS EN 15079: 2015	0.002 % to 2.25 %
		Antimony	BS EN 15079: 2015	0.001 % to 0.07 %
		Magnesium	BS EN 15079: 2015	0.001 % to 0.2 %
		Cadmium	BS EN 15079: 2015	0.001 % to 0.1 %
6.	Zinc & Zinc Alloys	By FAAS/GFAAS/HG-Copper	ASTM E536: 2008	0.002 % to 6.0 %
		Magnesium	ASTM E536: 2008	0.001 % to 0.4 %
		Lead	ASTM E536: 2008	0.0005 % to 1.6 %
		Cadmium	ASTM E536: 2008	0.0005 % to 0.5 %
		Iron	ASTM E536: 2008	0.0005 % to 0.1 %
		By OES Aluminium	ASTM E1507: 2003	0.001 % to 5.0 %
		Copper	ASTM E1507: 2003	0.002 % to 6.0 %
		Magnesium	ASTM E1507: 2003	0.001 % to 0.4 %
		Lead	ASTM E1507: 2003	0.0005 % to 1.6 %
		Cadmium	ASTM E1507: 2003	0.0005 % to 0.5 %
		Tin	ASTM E1507: 2003	0.0005 % to 0.1 %
		Nickel	ASTM E1507: 2003	0.0005 % to 0.014 %
		Iron	ASTM E1507: 2003	0.0005 % to 0.1 %

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7.	Metals	Salt Spray	ASTM B117, BS AU 148, IS 9844	Qualitative
		CASS	ASTM B368	Qualitative
II. BUILDING MATERIALS				
1.	Cement (OPC, PPC, SRCS, SLAG, White)	Loss on Ignition	IS 4032: 1985	0.1 % to 7 %
		Insoluble Residue	IS 4032: 1985	0.10 % to 35 %
		Sulphuric Anhydride	IS 4032: 1985	0.1 % to 5 %
		Alumina	IS 4032: 1985	0.1 % to 15 %
		Iron	IS 4032: 1985	0.10 % to 10 %
		Calcium	IS 4032: 1985	30 % to 70 %
		Magnesium	IS 4032: 1985	0.10 % to 10 %
		Chlorides	IS 4032: 1985	0.002 % to 0.5 %
		Silica	IS 4032: 1985	15 % to 50 %
2.	Cement Concrete	Sulphate	IS 4032: 2009	0.1 % to 5 %
		Chloride	IS 14959 (Part 2): 2001	0.01 % to 0.5 %
3.	Sand, Coarse & Fine Aggregate	Alkali Reactivity Reduction in alkalinity Silica released	IS 2386 (Part 7): 2007	5 mmoles/l to 300 mmoles/l

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4.	Clays & Soil	pH	IS 2720 (Part 26): 2007	4 to 12
		Chloride	IS 14959: 2001	0.002 % to 0.5 %
		Sulphate	IS 2720 (Part 27): 2010	0.1 % to 5 %
		Organic Matter	IS 2720 (Part 22): 2010	0.05 % to 2 %
5.	Fly Ash	Silica	IS 1727: 1967	20 % to 70 %
		Alumina	IS 1727: 1967	10 % to 40 %
		Ferric Oxide	IS 1727: 1967	0.1 % to 10 %
		Magnesium Oxide	IS 1727: 1967	0.1 % to 5 %
		Sulphuric Anhydride	IS 1727: 1967	0.1% to 10 %
		Loss on Ignition	IS 1727: 1967	0.1 % to 5 %
6.	Admixture	Dry Materials Content	IS 9103: 1999	0.005 % to 60 %
		Ash Content	IS 9103: 1999	0.1 % to 50 %
		Relative Density	IS 9103: 1999	0.7 to 2.0
		Chloride Ion Content	IS 6925: 1973	0.002 % to 0.5 %
		pH	IS 9103: 1999	4 to 12
7.	Tiles	Resistance to Acid	IS 13630 (Part 8): 1993 (Glazed Tile)	Qualitative
		Resistance to Alkali	IS 13630 (Part 7): 1993 (Unglazed Tile)	Qualitative

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III. WATER				
1.	Water (Construction & Drinking Purpose)	Total Solid	IS 3025 (Part 15): 1984	10 mg/l to 3000 mg/l
		Total Suspended Solid	IS 3025 (Part 17): 1984	10 mg/l to 2000 mg/l
		Total Dissolved Solid	IS 3025 (Part 16): 1984	10 mg/l to 2000 mg/l
		Iron	ASTM D1068: 1996 / AAS	0.1 mg/l to 50 mg/l
		Calcium	IS 3025 (Part 40): 1991/AAS	5 mg/l to 500 mg/l
		Magnesium	IS 3025 (Part 46): 1994 /AAS	5 mg/l to 500 mg/l
		Manganese	ASTM D858: 1995 / AAS	0.1 mg/l to 50 mg/l
		Sodium	IS 3025 (Part 45): 1993/AAS	10 mg/l to 400 mg/l
		Chloride	IS 3025 (Part 32): 1988	10 mg/l to 2500 mg/l
		Copper	IS 3025 (Part 42): 1992/AAS	0.1 mg/l to 50 mg/l
		Chlorine	IS 3025 (Part 26): 1986	0.2 mg/l to 20 mg/l
		Fluoride	ASTM D1179: 1993	0.2 mg/l to 5mg/l
		Zinc	IS 3025 (Part 49): 1994 /AAS	0.2 mg/l to 10 mg/l
		Acidity	IS 3025 (Part 22): 1986	50 mg/l to 500 mg/l
		Alkalinity	IS 3025 (Part 23): 1986	50 mg/l to 500 mg/l

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	Water (Construction & Drinking Purpose)	Hardness	IS 3025 (Part 21): 1983	10 mg/l to 500 mg/l
		Turbidity	IS 3025 (Part 10): 1984	1 NTU to 10 NTU
		Organic Matter	IS 3025 (Part 18): 1984	20 mg/l to 200 mg/l

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