

**Laboratory** Spectro Testing & Research Center (P) Ltd., H-1143, Sitapura Industrial Area, Phase- III, Tonk Road, Jaipur, Rajasthan

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

**Discipline** Chemical Testing **Issue Date** 04.07.2014

**Certificate Number** T-3032 **Valid Until** 03.07.2016

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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
<b>I. METALS &amp; ALLOYS</b>				
<b>1.</b>	<b>Low Alloy &amp; Carbon Steel</b>	Carbon	ASTM E-415-2008	0.01% to 1.0%
		Silicon	ASTM E-415-2008	0.01% to 1.5%
		Manganese	ASTM E-415-2008	0.15% to 1.3%
		Sulphur	ASTM E-415-2008	0.01% to 0.10%
		Phosphorous	ASTM E-415-2008	0.007% to 0.07%
		Chromium	ASTM E-415-2008	0.01% to 2.8%
		Molybdenum	ASTM E-415-2008	0.025% to 1.5%
		Nickel	ASTM E-415-2008	0.02% to 4.5%
		Aluminium	ASTM E-415-2008	0.01% to 1.19%
		Copper	ASTM E-415-2008	0.05% to 0.25%
		Vanadium	ASTM E-415-2008	0.005% to 0.5%
<b>2.</b>	<b>Austenitic &amp; Ferritic Stainless Steel</b>	Tin	ASTM E-415-2008	0.005% to 0.03%
		Carbon	ASTM E-1086-2008	0.015% to 0.9%
		Silicon	ASTM E-1086-2008	0.3% to 0.6%

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	<b>Austenitic &amp; Ferritic Stainless Steel</b>	Manganese	ASTM E-1086-2008	1.0% to 10%
		Sulphur	ASTM E-1086-2008	0.005% to 0.035%
		Phosphorous	ASTM E-1086-2008	0.01% to 0.05%
		Chromium	ASTM E-1086-2008	10% to 21%
		Molybdenum	ASTM E-1086-2008	0.07% to 4.0%
		Nickel	ASTM E-1086-2008	1.5% to 25%
		Aluminium	ASTM E-1086-2008	0.005% to 0.03%
		Copper	ASTM E-1086-2008	0.08% to 1.5%
		Vanadium	ASTM E-1086-2008	0.04% to 0.12%
		Titanium	ASTM E-1086-2008	0.002% to 0.45%
<b>3. Aluminium &amp; its Alloys</b>		Cobalt	ASTM E-1086-2008	0.015% to 0.10%
		Copper	ASTM-E-1251-2011	0.03% to 1.50%
		Magnesium	ASTM-E-1251-2011	0.02% to 0.4%
		Silicon	ASTM-E-1251-2011	0.01% to 11.0%
		Iron	ASTM-E-1251-2011	0.05% to 1.20%
		Nickel	ASTM-E-1251-2011	0.02% to 0.25%

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	<b>Aluminium &amp; its Alloy</b>	Manganese	ASTM-E-1251-2011	0.02% to 0.6%
		Zinc	ASTM-E-1251-2011	0.1% to 0.9%
		Lead	ASTM-E-1251-2011	0.02% to 0.4%
		Tin	ASTM-E-1251-2011	0.02% to 0.2%
		Titanium	ASTM-E-1251-2011	0.02% to 0.25%
		Chromium	ASTM-E-1251-2011	0.03% to 0.06%
		Vanadium	ASTM-E-1251-2011	0.005% to 0.022%
<b>4.</b>	<b>Copper &amp; its Alloys</b>	Tin	BS EN 15079-2007	0.001% to 12.0%
		Lead	BS EN 15079-2007	0.001% to 20.0%
		Aluminium	BS EN 15079-2007	0.01% to 6.0%
		Cadmium	BS EN 15079-2007	0.001% to 0.5%
		Iron	BS EN 15079-2007	0.01% to 6.0%
		Nickel	BS EN 15079-2007	0.005% to 7.0%
		Manganese	BS EN 15079-2007	0.01% to 4.0%
		Arsenic	BS EN 15079-2007	0.001% to 0.30%
		Bismuth	BS EN 15079-2007	0.001% to 0.10%

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	<b>Copper &amp; its Alloys</b>	Phosphorus	BS EN 15079-2007	0.001% to 0.20%
		Silicon	BS EN 15079-2007	0.005% to 2.0%
		Zinc	BS EN 15079-2007	0.02% to 32.0%
		Silver	BS EN 15079-2007	0.001% to 0.01%
		Antimony	BS EN 15079-2007	0.001% to 0.01%
		Cobalt	BS EN 15079-2007	0.001% to 0.01%
		Copper	BS EN 15079-2007	35.0% to 99.9%
<b>II. METALLIC COATINGS AND TREATMENT SOLUTIONS</b>				
<b>1.</b>	<b>Metallic coatings</b>	Uniformity of coating on Zinc coated Articles	IS: 2633-1986 (RA 2006)	Qualitative Test
		Determination of Mass of Zinc coating on Zinc coated iron & Steel Article	IS: 6745-1972 (RA 2006)	1 g/m <sup>2</sup> to 1000 g/m <sup>2</sup>
<b>III. WATER</b>				
<b>1.</b>	<b>Drinking Water, Water for Food, Water for Ice, Mineral Water</b>	Colour	IS: 3025 (Part-4) 1983 (RA 2006) APHA-2120-2012	(1 to 500) Hazen units
		Odor	IS: 3025 (Part-5) 1983 (RA 2006) APHA-2150-2012	Agreeable / Disagreeable

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	<b>Drinking Water, Water for Food, Water for Ice, Mineral Water</b>	Inorganic Solids	IS: 3025 (Part-18) 1984 (RA 2006)	(10 to 2000) mg/l
		Turbidity	IS: 3025 (Part-10) 1984 (RA 2006) APHA-2130-B-2012	1 NTU to 30 NTU
		pH Value	IS: 3025 (Part-11) 1983 (RA 2006)	6.5 to 8.5
		Total Hardness	IS: 3025 (Part-21) 2009 APHA-2340-C-2012	10 mg/l to 800 mg/l
		Iron	IS: 3025 (Part-53) 2003 APHA 3500 Fe-B-2012	0.01 mg/l to 2 mg/l
		Chloride	IS: 3025 (Part-32) 1988 (RA 2009)	10 mg/l to 1000 mg/l
		Sulphate	IS: 3025 (Part-24) 1986 (RA 2009)	0.1 mg/l to 500 mg/l
		Total Dissolved Solids	IS: 3025 (Part-16) 1984 (RA 2009)	10 mg/l to 2000 mg/l
		Calcium	IS: 3025 (Part -40) 1991 (RA 2009)	10 mg/l to 500 mg/l
	Magnesium	IS: 3025 (Part -46) 1994 (RA 2009)	10 mg/l to 200 mg/l	

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	<b>Drinking Water, Water for Food, Water for Ice, Mineral Water</b>	Acidity/Alkalinity	IS: 3025 (Part-22, 23) 1986 (RA 2009) APHA 2310-A-2012, APHA 2310-B-2012	10 mg/l to 600 mg/l
		Residual Free Chlorine	IS: 3025 (Part-26) 1986 (RA-2009) APHA 4520-2012	0.01 mg/l to 10 mg/l
2.	<b>Reagent Grade Water</b>	Colour retention of KMnO <sub>4</sub>	IS: 1070-1992	1s to 3600s
		Specific Conductivity	IS: 3025 (Part-14)-1984 APHA 2510- 2012	(0.1 to 25) µmhos/cm
		pH Value	IS: 3025 (Part-11) 1983 (RA 2006)	0.1 to 12
		Total Solids/Non Volatile Residue	IS: 3025 (Part-11) 1983 (RA 2006)	(0 to 100) mg/l
		Silica	IS: 3025 (Part-35)-1988 (RA 1999) APHA 1995-2012	0.01 mg/l to 10 mg/l
3.	<b>Effluent Water, Waste Water</b>	COD	IS: 3025 (Part-58)-2006 APHA 5220B- 2012	5 mg/l to 10000 mg/l
		Dissolve Oxygen	IS: 3025 (Part-38) 1989 (RA 2009) APHA 4500-C-2012	1 mg/l to 10 mg/l

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	<b>Effluent Water, Waste Water</b>	Oil and Grease	IS: 3025 (Part-39) 1991 (RA 2009) APHA 5520-2012	1 mg/l to 5000 mg/l
		B O D	IS: 3025 (Part-44) 1993 (RA 2009) APHA 5210-2012	5 mg/l to 10000 mg/l
		Total Dissolved Solids	IS: 3025 (Part-16) 1984 (RA 2009)	10 mg/l to 20000 mg/l
		Total Suspended Solids	IS: 3025(Part-15)-1984 APHA 2540-2012	1 mg/l to 10000 mg/l
<b>4.</b>	<b>Water for Construction</b>	pH Value	IS: 3025 (Part-11) 1983 (RA 2006)	2 to 12
		Inorganic Solids	IS: 3025 (Part-18) 1984 (RA 2006)	10 mg/l to 5000 mg/l
		Organic Solids	IS: 3025 (Part-18) 1984 (RA 2006)	10 mg/l to 500 mg/l
		Chloride	IS: 3025 (Part-32) 1988 (RA 2009)	10 mg/l to 2000 mg/l
		Sulphate	IS: 3025 (Part-24) 1986 (RA 2009)	5 mg/l to 500 mg/l

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	<b>Water for Construction</b>	Suspended Matter	IS: 3025 (Part-17)-1984 (RA 2009)	5 mg/l to 2000 mg/l
		Acidity & Alkalinity	IS: 3025(Part-22)-1986 (RA 2009) & IS: 3025(Part-23)-1986 (RA 2009)	0.1 ml to 50 ml
<b>IV.</b>	<b>BUILDING MATERIALS</b>			
<b>1.</b>	<b>Cement (OPC, PPC, PSC)</b>	LOI	IS: 4032-1985 (RA 2009)	0.1% to 20%
		Al <sub>2</sub> O <sub>3</sub>	IS: 4032-1985 (RA 2009)	0.2% to 20%
		SiO <sub>2</sub>	IS: 4032-1985 (RA 2009)	1% to 50%
		Fe <sub>2</sub> O <sub>3</sub>	IS: 4032-1985 (RA 2009)	0.01% to 10%
		SO <sub>3</sub>	IS: 4032-1985 (RA 2009)	0.01% to 10%
		CaO	IS: 4032-1985 (RA 2009)	0.2% to 70%
		MgO	IS: 4032-1985 (RA 2009)	0.1% to 10%
		Cl	IS: 4032-1985 (RA 2009)	0.002% to 5%
		IR	IS: 4032-1985 (RA 2009)	0.1% to 40%
<b>2.</b>	<b>Concrete</b>	Chlorides	IS: 6925-1973 (RA 2008)	0.01% to 1.0%
		Sulphates	IS 4032-1985 (RA 2009)	0.01% to 1.0%



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3.	Aggregates	Chlorides	IS: 6925-1973 ( RA 2008)	0.01% to 1.0%
		Sulphates	IS 4032-1985 (RA 2009)	0.01% to 1.0%
		Alkali Aggregate Reactivity	IS: 2386 (Part-VII) 1963 (RA 2007)	(0.2 to 2500) millimoles/lit
4.	Admixture	Dry Material Content	IS: 9103- 1999 (RA 2008)	1% to 40%
		Ash Content	IS: 9103- 1999 (RA 2008)	0.1% to 20%
		pH	IS: 9103- 1999 (RA 2008)	2 to 12
		Relative Density	IS: 9103- 1999 (RA 2008)	1 to 2
		Chlorides	IS: 6925-1973 (RA 2008)	0.002% to 5%

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