

Laboratory V & G Industrial Testing Laboratories Pvt. Ltd., Plot No. 323G,
Baikampady Industrial Area, Baikampady, Mangalore, Karnataka

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5778 (In lieu of T-2406)

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Validity 24.05.2017 to 23.05.2019

Last Amended on 04.07.2018

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.	BUILDING MATERIALS			
1.	Cement (OPC/PPC/PSC)	Insoluble Residue	IS 4032	0.5 % to 35 %
		Loss on ignition	IS 4032	0.5 % to 7 %
		Iron (as Fe ₂ O ₃)	IS 4032	1.0 % to 8 %
		Alumina(as Al ₂ O ₃)	IS 4032	3.0 % to 10 %
		Silica (as SiO ₂)	IS 4032	15 % to 30 %
		Sulphuric anhydride (as SO ₃)	IS 4032	0.1 % to 4.0 %
		Magnesia (as MgO)	IS 4032	0.5 % to 8 %
	Calcium (as CaO)	IS 4032	20 % to 70 %	
2.	Admixture (Plasticizer / Super plasticizer)	pH	IS 9103	4 to 12
		Relative Density	IS 9103	1.000 to 1.500
		Dry Material Content	IS 9103	15 % to 45 %
		Ash Content	IS 9103	1 % to 20 %
		Chloride ion content	IS 6925	0.01 % to 0.15 %
3.	Bitumen	Solubility in Trichloroethylene	IS 1216	10 % to 100 %
II.	METALS & ALLOYS			
1.	Plain Carbon & Low Alloy Steels	Carbon	IS 228 (Part 1)	0.05 % to 1.50 %
		Sulphur	IS 228 (Part 9)	0.01 % to 0.2 %
		Phosphorus	IS 228 (Part 3)	0.01 % to 0.2 %
		Silicon	IS 228 (Part 8)	0.05 % to 5.0 %
		Manganese	IS 228 (Part 2)	0.1 % to 1.5 %
III.	METALLIC COATING & TREATMENT SOLUTIONS			
1.	Galvanized articles	Mass of Zinc Coating	IS 6745	5 g/m ² to 1000 g/m ²

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2.	Aluminium sections	Anodic Coating	IS 5523	1 micron to 200 micron
IV.	WATER			
1.	Construction Water	pH	IS 3025 (Part 11)	4 to 12
		Limits of Acidity	IS 456	0.1 ml to 10 ml
		Limits of Alkalinity	IS 456	0.1 ml to 100 ml
		Sulphates as SO ₃	IS 3025 (Part 24)	10 mg/l to 400 mg/l
		Chloride as Cl	IS 3025 (Part 32)	5 mg/l to 2000 mg/l
		Total Suspended solid	IS 3025 (Part 17)	5 mg/l to 2000 mg/l
		Organic Volatile Residue	IS 3025 (Part 18)	1 mg/l to 300 mg/l
		Inorganic Fixed Residue	IS 3025 (Part 17)	1 mg/l to 300 mg/l

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MECHANICAL TESTING

I.	MECHANICAL PROPERTIES OF METALS			
1.	Ferrous Materials, Alloys & Products	Tensile Strength	IS 1608	10 kN to 600 kN
		Yield Strength	SA 370 ASME BPVC IIA	10 kN to 600 kN
		Elongation		5 % to 60 %
		Mass Per Meter	IS 1786	0.050 kg/m to 10 kg/m
		Bend	IS 1786 IS 1599	Qualitative (Mandrel dia-12, 16, 19, 20, 24, 32, 44, 50, 64, 90, 100, 150, 175 mm)
		Re-Bend	IS 1786	Qualitative (Mandrel dia-12, 16, 19, 20, 24, 32, 44, 50, 64, 90, 100, 150, 175 mm)
		Vickers Hardness	IS 1501 (Part 1)	25 HV ₁₀ to 800 HV ₁₀
	Brinell Hardness	IS 1500 (Part 1)	100 HBW to 600 HBW	
2.	Welds & Welded Test Specimens	Tensile Strength	IS 1608 IS 3600 (Part 3) IS 3600 (Part 4) ASME Sec-IX QW 150	10 kN to 600 kN
		Yield Strength	IS 1608 IS 3600 (Part 3) IS 3600 (Part 4)	10 kN to 600 kN
		Elongation	IS 1608 IS 3600 (Part 4)	0.5 % to 60 %
		Bend	IS 3600 (Part 5) IS 3600 (Part 6) IS 1599 ASME Sec-IX QW-160	Qualitative (Mandrel dia-12, 16, 19, 20, 24, 32, 44, 50, 64, 90, 100, 150, 175 mm)
		Vickers Hardness	IS 1501 (Part 1)	25 HV ₁₀ to 800 HV ₁₀
		Brinell Hardness	IS 1500 (Part 1)	100 HBW to 600 HBW

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		Fracture	IS 3600 (Part 8) ASME Sec-IX QW182	Qualitative
		Nick break	IS 3600 (Part 8)	Qualitative
		Flattening	IS 2328	Qualitative
		Macro Etch	IS-3600 (Part 9) ASME Section IX QW 183 &184	Qualitative
II.	BUILDING MATERIALS			
1.	Cement	Density	IS 4031 (Part 11)	2 g/cc to 3.5 g/cc
		Consistency	IS 4031 (Part 4)	10 % to 50 %
		Fineness Blaine	IS 4031 (Part 2)	100 m ² /kg to 600 m ² /kg
		Initial Setting Time	IS 4031 (Part 5)	15 minute to 300 minute
		Final Setting Time		15 minute to 600 minute
		Compressive Strength	IS 4031 (Part 6)	10 N/mm ² to 100 N/mm ²
		Soundness Le-chatelier	IS 4031 (Part 3)	0.5 mm to 20 mm
		Soundness (Autoclave)	IS 4031 (Part 3)	0.02 % to 1 %
2.	Coarse Aggregate	Sieve Analysis	IS 2386 (Part 1)	0.05 % to 100 %
		Bulk Density	IS 2386 (Part 3)	1 kg/L to 2 kg/L
		Abrasion Value	IS 2386 (Part 4)	1.0 % to 60 %
		Crushing Value	IS 2386 (Part 4)	1.0 % to 60 %
		10% Fineness Value	IS 2386 (Part 1)	2 Tone to 50 Tone
		Impact Value	IS 2386 (Part 4)	1.0 % to 60 %
		Soundness-Na ₂ SO ₄	IS 2386 (Part 5)	0.5 % to 30 %
		Soundness-MgSO ₄		0.5 % to 30 %
		Flakiness Index	IS 2386 (Part 1)	1.0 % to 100 %
		Elongation Index	IS 2386 (Part 1)	1.0 % to 100 %
		Water Absorption	IS 2386 (Part 3)	0.01 % to 20 %
		Specific Gravity	IS 2386 (Part 3)	2.0 to 4.0

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		Deleterious Material Material finer than 75 μ IS Sieve Clay Lumps Coal & Lignite	IS 2386 (Part 2)	Upto 5 % Upto 2 % Upto 2 %
3.	Fine Aggregate	Sieve Analysis	IS 2386 (Part 1)	0.05 % to 100 %
		Bulk Density	IS 2386 (Part 3)	1 kg/L to 2 kg/L
		Soundness- Na_2SO_4 Soundness- MgSO_4	IS 2386 (Part 5)	0.5 % to 30 % 0.5 % to 30 %
		Water Absorption	IS 2386 (Part 3)	0.01 % to 20 %
		Specific Gravity	IS 2386 (Part 3)	2.0 to 4.0
		Deleterious Material Material finer than 75 μ IS Sieve Clay Lumps Coal & Lignite	IS 2386 (Part 2)	upto 5 % upto 2 % upto 2 %
		Organic Impurities	IS 2386 (Part 2)	Qualitative
		Silt Clay and fine Dust	IS 2386 (Part 2)	upto 20 %
4.	Fly-Ash	Specific Gravity	IS 1727	1.0 to 3.0
		Soundness (Autoclave Expansion)	IS 1727	0.02 % to 1 %
		Particle retained on 45 micron IS Sieve (wet sieving)	IS 1727	2.0 % to 40 %
		Fineness (Specific Surface) Blaine's	IS 1727	200 m^2/kg to 600 m^2/kg
5.	Building Bricks	Compressive Strength	IS 3495 (Part 1)	10 kg/cm^2 to 300 kg/cm^2
		Water Absorption	IS 3495 (Part 2)	1 % to 30 %
		Efflorescence	IS 3495 (Part 3)	Qualitative
		Dimension -Length Dimension -Width Dimension -Height	IS 3495 (Part 4)	100 mm to 5000 mm 100 mm to 3000 mm 100 mm to 2000 mm
6.	Concrete	Compressive Strength	IS 516	1 N/mm^2 to 65 N/mm^2

Prince Garg
Convenor

N. Venkateswaran
Program Director

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7.	Refractory Material	Cold Crushing Strength	ASTM C133	5 N/mm ² to 100 N/mm ²
		Bulk Density	ASTM C134	1 g/cc to 3.5 g/cc
8.	Paver Block	Compressive Strength	IS 15658 Annex D	15 N/mm ² to 50 N/mm ²
9.	Bituminous Material	Bitumen content	ASTM D 2172	1 % to 10 %
10.	Bitumen	Penetration	IS 1203	upto 200 (1/10 of mm)
		Flash Point	IS 1448 (Part 69)	100 °C to 350 °C
		Softening Point	IS 1205	20 °C to 80 °C
		Ductility	IS 1208	upto 100 cm
III.	SOIL AND ROCK			
1.	Soil	Light Compaction: MDD	IS 2720 (Part 7)	1 g/cc to 2.5 g/cc
		Light Compaction: OMC		1 % to 30 %
		Heavy Compaction: MDD	IS 2720 (Part 8)	1 g/cc to 3 g/cc
		Heavy Compaction: OMC		1 % to 25 %
		CBR Value	IS 2720 (Part 16)	1 % to 50 %
		Grain size analysis	IS 2720 (Part 4)	upto 100 %
		Liquid Limit	IS 2720 (Part 5)	15 % to 80 %
		Plastic Limit	IS 2720 (Part 5)	upto 50 %
Free Swell Index	IS 2720 (Part 40)	upto 50 %		
2.	GSB/WMM	Heavy Compaction: MDD	IS 2720 (Part 8)	1.80 g/cc to 2.50 g/cc
		Heavy Compaction: OMC		3 % to 10 %
		CBR	IS 2720 (Part 16)	20 % to 80 %
		Sieve Analysis	IS 23016 (Part 1)	upto 100 %
		Liquid Limit & Plastic limit	IS 2720 (Part 5)	upto 35 %

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NON - DESTRUCTIVE TESTING

I.	BUILDING MATERIALS - REINFORCED CONCRETE STRUCTURES			
1.	Reinforced Concrete Structures	Rebound Hammer	IS 13311 (Part 2)	20 MPa to 60 MPa
		Ultra sonic pulse velocity	IS 13311 (Part 1)	Upto 5 km/sec