

Laboratory

Structwel Designers & Consultants Pvt. Ltd., Plot No. 460/B, 4th Phase, NTT Circle, Peenya Industrial Area, Bengaluru, Karnataka

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7363

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Validity 06.06.2018 to 05.06.2020

Last Amended on --

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
CHEMICAL TESTING				
I.	BUILDING MATERIALS			
1.	Cement			
A.	Ordinary Portland Cement (OPC)	Loss on Ignition	IS 4032	1.0% to 15.0%
		Silica (SiO ₂)	IS 4032	15.0% to 30.0%
		Ferric Oxide (Fe ₂ O ₃)	IS 4032	1.0% to 10.0%
		Alumina (Al ₂ O ₃)	IS 4032	1.0% to 10.0%
		Calcium Oxide (CaO)	IS 4032	40.0% to 75.0%
		Magnesia (MgO)	IS 4032	1.0% to 10.0%
		Sulphuric Anhydride (SO ₃)	IS 4032	0.5% to 5.0%
		Insoluble Residue	IS 4032	0.5% to 5.0%
		Total Alkali as Sodium Oxide (Na ₂ O)	IS 4032	0.05% to 3.0%
	Chloride	IS 4032	0.01 to 1.0%	
B.	Portland Pozzolana Cement (PPC)	Loss on Ignition	IS 4032	1.0% to 15.0%
		Magnesia (MgO)	IS 4032	1.0% to 10.0%
		Sulphuric Anhydride (SO ₃)	IS 4032	1.0% to 5.0%
		Insoluble Residue	IS 4032	1.0% to 5.0%
		Total Alkali as Sodium Oxide (Na ₂ O)	IS 4032	0.05% to 3.0%
	Chloride	IS 4032	0.01 to 1.0%	
C.	Portland Slag Cement (PSC)	Loss on Ignition	IS 4032	1.0% to 15.0%
		Magnesia (MgO)	IS 4032	1.0% to 10.0%
		Sulphuric Anhydride (SO ₃)	IS 4032	1.0% to 5.0%
		Insoluble Residue	IS 4032	5.0% to 40.0%
		Total Alkali as Sodium Oxide (Na ₂ O)	IS 4032	0.05% to 3.0%
	Chloride	IS 4032	0.01 to 1.0%	

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Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
2.	Pozzolanic Material (Flyash)	Loss on Ignition	IS 1727	0.1% to 10.0%
		Silica (SiO ₂)	IS 1727	5.0% to 90.0%
		Ferric Oxide (Fe ₂ O ₃)	IS 1727	1.0% to 15.0%
		Alumina (Al ₂ O ₃)	IS 1727	1.0% to 25.0%
		Calcium Oxide (CaO)	IS 1727	1.0% to 50.0%
		Magnesia (MgO)	IS 1727	1.0% to 10.0%
		Sulphuric Anhydride (SO ₃)	IS 1727	0.01% to 5.0%
		Sodium Oxide (Na ₂ O)	IS 3812 (Part 1 and Part 2)	0.01% to 1.5%
		Chloride	IS 4032	0.005 to 0.5%
3.	Admixture	pH	IS 9103	1.0% to 12.0%
		Ash Content	IS 9103	1.0% to 30.0%
		Dry Material Content	IS 9103	5.0% to 60.0%
		Relative Density	IS 9103	0.7% to 2.0%
		Chlorides	IS 6925	0.01% to 5.0%
II.	WATER			
1.	Water (Construction Purpose)	pH	IS 3025 (Part 11)	1.0 to 12.0
		Sulphate -Gravimetric Method	IS 3025 (Part 28)	5mg/L to 2000mg/L
		Chloride - Argentometric Method	IS 3025 (Part 32)	10mg/L to 2000mg/L
		Alkalinity - Indicator method -0.02 N H ₂ SO ₄ Required to neutralize 100ml of water	IS 3025 (Part 23) IS 456	0.1mL to 50mL
		Alkalinity - Indicator method -Acidity (0.02 N NaOH) Required to neutralize 100ml of water	IS 3025 (Part 22) IS 456	0.1mL to 5mL
		Hardness -EDTA Method	IS 3025 (Part 21)	1 mg/L to 10000 mg/L

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		Volatile Residue	IS 3025 (Part 18)	1 mg/L to 1000 mg/L
		Fixed Residue		1 mg/L to 1000 mg/L
		Total Suspended solid	IS 3025 (Part 17)	1 to 100 mg/L
III.	METALS & ALLOYS			
1.	Low alloy Steel, Plain Carbon steel, Mild steel, Stainless Steel	Carbon	IS 228 (Part 1)	0.01% to 1.5%
Sulphur		IS 228 (Part 9)	0.005% to 0.25%	
Phosphorous		IS 228 (Part 3)	0.005% to 0.25%	

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<u>MECHANICAL TESTING</u>				
I.	BUILDING MATERIALS			
1.	Coarse Aggregate	Aggregate Abrasion -by Los Angele's	IS 2386 (Part 4)	1% to 50%
		Specific Gravity	IS 2386 (Part 3)	1 to 4
		Water Absorption	IS 2386 (Part 3)	1 % to 4 %
		Bulk Density	IS 2386 (Part 3)	1 kg/L to 2 kg/L
		Sieve Analysis	IS 2386 (Part 1)	150 µm to 100mm
		Aggregate Impact	IS 2386 (Part 4)	1 % to 50 %
		Aggregate Crushing	IS 2386 (Part 4)	1 % to 50 %
		Flakiness Index	IS 2386 (Part 1)	1 % to 70 %
2.	Fine Aggregate	Elongation Index		1 % to 70 %
		Specific Gravity	IS 2386 (Part 3)	1 to 4
		Water Absorption	IS 2386 (Part 3)	1 % to 4 %
		Bulk Density	IS 2386 (Part 3)	1 kg/L to 2 kg/L
		Sieve Analysis	IS 2386 (Part 1)	150 µm to 100mm
		Bulkage	IS 2386 (Part 3)	1 % to 50 %
		Materials Finer than 75 µm	IS 2386 (Part 1)	1 % to 50 %
3.	Concrete Core, Cylinder, Cube, Masonry blocks	Compressive Strength	IS 456 IS 516	5 N/mm ² to 80 N/mm ²
		Density	IS 2185 (Part 1)	1800 kg/m ³ to 2500 kg/m ³
		Compressive Strength	IS 2185 (Part 1)	1 N/mm ² to 40 N/mm ²
		Water Absorption	IS 2185 (Part 1)	0.001% to 1.0 %
4.	Bricks	Water Absorption	IS 3495 (Part 2)	5% to 35%
		Compressive Strength	IS 3495 (Part 1)	1 N/mm ² to 25 N/mm ²
		Efflorescence	IS 3495 (Part 3)	Qualitative
5.	Paver Block	Dimension -Length	IS 15658	35mm to 300 mm
		-Width		35mm to 300 mm
		Plan Area	IS 15658	0.15m ² to 0.3m ²

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6.	Cement	Water Absorption	IS 15658	0.1% to 25%
		Compressive Strength	IS 15658	10 N/mm ² to 80 N/mm ²
		Tensile Splitting Strength	IS 15658	0.5 N/mm ² to 10N/mm ²
		Consistency	IS 4031 (Part 4)	20 % to 45 %
		Setting Time -Initial - Final	IS 4031 (Part 5)	5 min to 300 min 30 min to 600min
		Soundness -by Le-Chatlier method	IS 4031 (Part 3)	0.05mm to 10mm
		Fineness -by dry Sieving	IS 4031 (Part 1)	1 % to 10 %
7.	Pozzolanic Material (Flyash)	Compressive strength	IS 4031 (Part 6)	10 N/mm ² to 80 N/mm ²
		Fineness by specific surface -by Blaine air permeability method	IS 4031 (Part 2)	200m ² /kg to 500 m ² /kg
		Soundness	IS 1727	0.01mm to 100mm
		Setting Time - Initial - Final	IS 1727	5 min to 300min 10 min to 700min
		Compressive strength	IS 1727	5 N/mm ² to 80 N/mm ²
		Specific surface	IS 1727	200m ² /kg to 500 m ² /kg
II.	MECHANICAL PROPERTIES OF METALS	Specific Gravity	IS 1727	1.5 to 3
1.	High Strength deformed Steel bars and wires for concrete reinforcement	Tensile Strength	IS 1608	100 N/mm ² to 900 N/mm ²
		Yield Strength	IS 1786	100 N/mm ² to 900 N/mm ²
		Elongation		1% to 50%
		Bend Test	IS 1599 IS 1786	Qualitative (Mandrel Diameter 12,16,18,20,24,30,32,36, 40,48,50,56,64,70,75, 80 96,100, 128,160,240mm)

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		Rebend Test	IS 1786	Qualitative (Mandrel Diameter 24,30,32,36, 40,42,48,56,60, 72,84, 96,112,120,128,140, 160,175,200,224,256 mm)
III.	WOOD AND WOOD PRODUCTS			
1.	Door Shutter	Dimensions -Length -Width -Thickness -squareness (on a length of 500mm)	IS 4020 (Part 2)	2000 mm – 3000 mm 600 mm to 900 mm 20 mm to 40 mm 02 mm to 2.0 mm
		End Immersion	IS 4020 (Part 13)	Qualitative
		Knife Test	IS 4020 (Part 14)	Qualitative
		Glue Adhesion	IS 4020 (Part 15)	1mm to 150mm
IV.	SOIL			
1.	Soil			
		Water Content - Dry Density relation using Light Compaction	IS 2720 (Part 7)	Maximum dry density 1.2g/cc to 2.2g/cc Optimum Moisture content 2% to 30%
		Water Content - Dry Density relation using Heavy Compaction	IS 2720 (Part 8)	Maximum dry density 1.5g/cc to 2.4g/cc Optimum Moisture content 1% to 30%
		Liquid Limit	IS 2720 (Part 5)	1% to 80%
		Plastic Limit	IS 2720 (Part 5)	1% to 80%
		Laboratory California Bearing Ratio	IS 2720 (Part 16)	2% to 50%

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<u>MECHANICAL TESTING</u>				
AT SITE				
1.	Soil	Field Density -Core Cutter	IS 2720 (Part 29)	Dry density 1.0g/cc to 2.0g/cc Moisture content 1% to 30%
		Field Dry Density -Sand Replacement	IS 2720 (Part 28)	Dry density 1.0g/cc to 2.5g/cc Moisture content 1% to 30%

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<u>NON DESTRUCTIVE TESTING</u>				
I.	BUILDING MATERIALS – REINFORCED CONCRETE STRUCTURES			
1.	Concrete	Schmidt Rebound Hammer	IS 13311 (Part 2)	5 N/mm ² to 50 N/mm ²
		Ultrasonic Pulse Velocity	IS 13311 (Part 1)	0.1 km/sec to 6 km/sec

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