

Laboratory Standard Testing Laboratory, Plot No. 782, Kanjhwala Industrial Area, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-6608

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Validity 05.08.2018 to 04.08.2020

Last Amended on 16.08.2018

Sl.	Product (s) / Material of Test	Specific Test Performed	Test Method / Standard against which tests are performed	Range of Testing / Limits of Detection
<u>CHEMICAL TESTING</u>				
I.	BUILDING MATERIAL			
1.	Cement	Loss on Ignition	IS 4032	0.2% to 10%
		Silica	IS 4032	15% to 40%
		Insoluble Residue	IS 4032	0.1% to 40%
		Iron Oxide	IS 4032	0.1% to 10%
		Aluminum Oxide	IS 4032	1.0% to 20%
		Calcium Oxide	IS 4032	40% to 70%
		Magnesium Oxide	IS 4032	0.1% to 20%
		Sulfuric anhydride	IS 4032	0.1% to 10%
		Chloride	IS 4032 Amendment No-2	0.006% to 0.2%
		Alkali Content	IS 4032	0.001% to 1.0%
2.	Concrete	Chloride	IS 14959 IS 4032	0.001% to 2% (0.001%)
		Sulphate	IS 2317 IS 4032	0.001% to 5% (0.001%)
		Alkali Content	IS 4032	0.001% to 1.0% (0.001%)
3.	Fly ash	SiO ₂	IS 4032	5 % to 70%
		Magnesia, % by mass	IS 1727	1 % to 5%
		Total Sulphur (as SO ₃)	IS 1727	1 % to 10%
		LOI, % by mass	IS 1727	0.2 % to 20%
		Chloride	IS 1727	0.005 to 1%
		Available Alkali	IS 4032	0.001% to 2%
Reactive silica	IS 3812	5% to 40%		

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4.	Other Admixture	pH	IS 9103	2% to 14
		Dry material	IS 9103	0.1% to 100%
		Ash content	IS 9103	0.1% to 20%
		Relative density	IS 9103	1.000% to 1.500%
		Chloride	IS 6925	0.005% to 2%
5.	Other (Micro Silica)	Silica	IS 1727	70% to 95%
		Moisture	IS 1727	0.1% to 5%
		L.O.I	IS 1727	0.1% to 5%
		Alkali Content	IS 4032	0.001% to 2%
II.	METAL & ALLOYS			
1.	Carbon Steel	Carbon	IS 228 (Part 1)	0.05% to 1.50%
		Manganese	IS 228 (Part 2)	0.05% to 1.50%
		Phosphorous	IS 228 (Part 3)	0.01% to 1.50%
		Sulphur	IS 228 (Part 9)	0.01% to 0.25%
		Silicon	IS 228 (Part 8)	0.05% to 1.0%
		Carbon Equivalent	IS 228 (Part 1 & 2) IS 1786	0.05% to 1.50%
2.	Alloys Steel	Carbon	IS 228 (Part 1)	0.05% to 0.4%
		Manganese	IS 228 (Part 2)	0.05% to 1.50%
		Nickel	IS 228 (Part 5)	0.1% to 30%
		Chromium	IS 228 (Part 6)	0.1% to 30%
		Silicon	IS 228 (Part 8)	0.05% to 2.0%
		Molybdenum	IS 228 (Part 7)	0.1% to 5.0%
		Sulphur	IS 228 (Part 9)	0.01% to 0.25%
		Phosphorous	IS 228 (Part 3)	0.01% to 1.5%
		Copper	IS 228 (Part 15)	0.05% to 5%

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3.	Stainless steel	Carbon	IS 228 (Part 1)	0.05% to 0.4%
		Manganese	IS 228 (Part 2)	0.05% to 1.50%
		Nickel	IS 228 (Part 5)	0.1% to 30%
		Chromium	IS 228 (Part 6)	0.1% to 30%
		Silicon	IS 228 (Part 8)	0.05% to 2.0%
		Molybdenum	IS 228 (Part 7)	0.1% to 5.0%
		Sulphur	IS 228 (Part 9)	0.01% to 0.25%
		Phosphorous	IS 228 (Part 3)	0.01% to 1.5%
		Copper	IS 228 (Part 15)	0.05% to 5%
4.	Special steel	Carbon	IS 228 (Part 1)	0.05% to 1.5%
		Manganese	IS 228 (Part 2)	0.05% to 1.0%
		Nickel	IS 228 (Part 5)	0.1% to 4.0%
		Chromium	IS 228 (Part 6)	0.1% to 2.0%
		Silicon	IS 228 (Part 8)	0.05% to 1.0%
		Molybdenum	IS 228 (Part 7)	0.1 % to 2.0%
		Sulphur	IS 228 (Part 9)	0.01 % to 0.25%
		Phosphorous	IS 228 (Part 3)	0.01% to 1.5%
		Copper	IS 228 (Part 15)	0.05 % to 5.0 %
5.	Other (HTS Wire)	Sulphur	IS 228 (Part 9)	0.001% to 0.25%
		Phosphorous	IS 228 (Part 3)	0.001% to 1.5%
III.	METALLIC COATING & TREATMENT SOLUTION			
1.	Metallic Coating	Mass of Zinc coating	IS 6745	10 to 500 g/m ²
		Thickness of Anodic Coating	IS 5523	2 to 50 micron

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IV.	WATER			
1.	Drinking Water	Colour	IS 3025 (Part 4)	Qualitative
		Taste	IS 3025 (Part 8)	Qualitative
		Turbidity	IS 3025 (Part 10)	1 to 50 NTU
		Odour	IS 3025 (Part 5)	Qualitative
		TDS	IS 3025 (Part 16)	01 mg/l to 20000mg/l
		Iron	IS 3025 (Part 53)	0.05 mg/l to 10 mg/l
		Fluoride	IS 3025 (Part 60)	0.05 mg/l to 10mg/l
		Nitrate	IS 3025 (Part 34)	0.5 mg/l to 100mg
		Magnesium	IS 3025 (Part 46)	0.5 mg/l to 100mg/l
		Calcium	IS 3025 (Part 40)	2.0 mg/l to 1000mg/1
		Total Hardness	IS 3025 (Part 21)	2.0 mg/l to 2000mg/l
		pH	IS 3025 (Part 11)	2 to 14
2.	Construction Water	pH	IS 3025 (Part 11)	2 to 14
		Total dissolved Solids	IS 3025 (Part 16)	10 mg/l to 5000mg/l
		Total Suspended Solids	IS 3025 (Part 17)	5 mg/l to 5000mg/l
		Acidity i.e 0.02 N NaOH in ml required for 100 ml water sample using phenolphthalein indicator	IS 3025 (Part 22)	0.1 ml to 10 ml
		Alkalinity i.e 0.02 N H2SO4 required for 100ml water sample using mixed indicator	IS 3025 (Part 23)	0.1 ml to 100 ml
		Organic Solid	IS 3025 (Part 18)	5 mg/l to 500 mg/l
		Inorganic Solid	IS 3025 (Part 18)	10 mg/l to 2000 mg/l
		Sulphates	IS 3025 (Part 24)	10 mg/l to 500 mg/l
		Chlorides	IS 3025 (Part 32)	10 mg/l to 5000 mg/l

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V.	POLLUTION & ENVIRONMENT			
1.	Waste Water (Effluents/ Sewage)	Oil & Grease	SOP Section-Chem/ 01/06/11 Issue no-01 Issue date-01.04.2012	0.1 mg/l to 250mg/l
		C.O.D	IS 3025:(Part 58)	5 mg/l to 1000mg/l
		B.O.D	IS 3025:(Part 44)	1 mg/l to 300mg/l
		pH	IS 3025:(Part 11)	2 to 14
VI.	ATMOSPHERIC POLLUTION			
1.	Ambient Air	1. PM ₁₀	IS 5182 (Part 23)2006 (Gravimetic Method) RA 2017	10 µg/m ³ to 1000µg/m ³
		PM _{2.5}	SOP-Chem/01/09/02 Issue dtd: 01.04.2016 Issue No.-00 Guideline volume 1 (Gravimetric Method)	10 µg/m ³ to 300µg/m ³
		NO ₂	IS 5182 (Part 6)	6 µg/m ³ to 200 µg/m ³
		SO ₂	IS 5182 (Part 2)	6 µg/m ³ to 100 µg/m ³
		NH ₃	SOP-Chem/01/09/06 Issue dtd: 01.04.2016 Issue No.-00 Indophenols Method Guideline Volume 1	20 µg/m ³ to 500 µg/m ³
2.	Stack Emission	PM	IS 11255(Part 1)	10 µg/m ³ to 500µg/m ³
		SO ₂	IS 11255 (Part 2)	5 mg/m ³ to 500 mg/m ³
		NO ₂	IS 11255 (Part 7)	10 mg/m ³ to 500mg/m ³

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3.	Fugitive emission	CO	IS 13270 By Orsat App.	0.1 % to 10%
		CO ₂	IS 13270 By Orsat App.	0.1% to 10%
		Oxygen(O ₂)	IS 13270 By Orsat App.	1% to 21 %
4.	Ambient Noise level(excluding vibration)	Noise Level Leq dB (A)	IS 9876	30 to 100 dB
5.	Source Noise level(excluding vibration)	Noise Level & Source	IS 4758	30 to 120 dB
VII. HAZARDOUS & RESTRICTED CHEMICALS				
1.	Safety of Toy	Migration of Certain Element Sb As Ba Cd Cr Pb Hg Se	IS 9873 (Part-3) ISO 8124-3	1mg/kg to 1000mg/kg 1mg/kg to 1000mg/kg
		Taste and smell	IS 9873 (Part-7) ISO 8124-7 CL. 4.6	Qualitative
2.	Requirement and Test method for finger paints	pH	IS 9873 (Part-7) ISO 8124-7 CL. 4.7	1 to 10

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<u>MECHANICAL TESTING</u>				
I.	MECHANICAL PROPERTIES OF METALS			
1.	Ferrous Material TMT Structural Steel, Pipe	Tensile Strength	IS 1608	100 to 800 N/mm ² Load range: 20 to 600 kN
		Yield/ Proof Strength	IS 1608	100 to 800 N/mm ² Load range: 20 to 600 kN
		Elongation	IS 1608	2% to 100%
		Mass	IS 1786	0.025 kg to 30 kg
		Bend Test	IS 1599	Mandrel dia 12, 20, 24, 30, 40, 50, 60,84, 100, 140, 175 mm
		Rebend Test	IS 1786	Mandrel dia 12, 20, 24, 30, 40, 50, 60, 84, 100, 140, 17 5mm
		Rib Area TMT (a) Mean Projected rib area (mm ² /mm) (b) Mean Projected transverse ribs (mm ² /mm)	IS 1786	0.32 mm ² to 5.44 mm ²
2.	Ferrous Material (Pipe)	Dimension	IS 1239 (Part 1) IS 1239 (Part 1) IS 2328	5 to 150 mm 0.2 to 20 mm Visual
		Diameter		
		Thickness Flattening Test		
3.	Ferrous Material (Welded Material)	Face Bend & Root Bend	IS 3600 (Part 5)	Qualitative

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4.	Ferrous Material (Hollow Section/Tube)	Depth of Section	IS 4923	25 to 180
		Width of Section	IS 4923	25 to 180
		Thickness	IS 4923	20 to 100
		Tensile Strength	IS 1608	100 to 800 N/mm ² Load Range 20 to 600 kN
		Yield Stress	IS 1608	100 to 800 N/mm ² Load Range 20 to 600 kN
		Elongation	IS 4923	2% to 100%
II.	BUILDING MATERIALS			
1.	Bricks	Water absorption	IS 3495 (Part 2)	0.5 to 50%
		Dimensions	IS 1077	L 1200 mm to 5000mm B1000 mm to 3000mm H 500 mm to 2000mm
		Efflorescence	IS 3495 (Part 3)	Qualitative
		Compressive Strength	IS 3495 (Part 1)	4 N/mm ² to 35 N/mm ²
2.	Pre-casted, C.C block (Paver Block)	Visual Inspection	IS 15658	Qualitative
		Dimension Length Width Thickness	IS 15658	50 mm to 600 mm 50 mm to 600 mm 50 mm to 200 mm
		Water Absorption	IS 15658	2 % to 20%
		Abrasion Resistance	IS 15658	0 to 10 mm
		Compressive Strength	IS 15658	5 N/mm ² to 100 N/mm ²
3.	Pre-casted C.C block (Hollow and Solid Concrete Block)	Dimension	IS 2185 (Part 1)	100 to 500 mm
		Density	IS 2185 (Part 1)	1000 kg/m ³ to 3000 kg/m ³
		Water Absorption	IS 2185 (Part 1)	1% to 10%
		Drying Shrinkage	IS 2185 (Part 1)	0.01% to 1%
		Compressive Strength	IS 2185 (Part 1)	2 N/mm ² to 20 N/mm ²

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4.	Fine Aggregates	Sieve Analysis	IS 2386 (Part 3)	0.150 mm to 10 mm
		Water absorption	IS 2386 (Part 3)	0.01% to 5%
		Specific Gravity	IS 2386 (Part 3)	2.00 to 3.40
		Deleterious Material (I) Material Finer than 75 micron	IS 2386 (Part 1)	0.1% to 20%
		(ii) Coal & lignite	IS 2386 (Part 2)	0.1% to 5%
		(iii) Clay lump	IS 2386 (Part 2)	0.1% to 20%
		Soundness (Na ₂ SO ₄)	IS 2386 (Part 5)	0.1% to 20%
		Bulk Density	IS 2386 (Part 3)	1.0 kg/l to 3.0 kg/l
		Organic Impurity	IS 2386 (Part 2)	Qualitative
		5.	Coarse Aggregate	Sieve Analysis
Elongation Index	IS 2386 (Part 1)			1% to 60%
Flakiness Index	IS 2386 (Part 1)			1% to 60%
Water absorption	IS 2386 (Part 3)			0.01% to 5%
Specific Gravity	IS 2386 (Part 3)			2.00 to 3.40
Impact Value	IS 2386 (Part 4)			5% to 60%
Crushing Value	IS 2386 (Part 4)			5% to 60%
10% Fine Value	IS 2386 (Part 4)			10 to 60 (Ton)
Deleterious material (I) Material Finer than 75 micron	IS 2386 (Part 1)			0.1% to 20%
(ii) Coal & lignite	IS 2386 (Part 2)			0.1% to 5%
(iii) Clay lump	IS 2386 (Part 2)			0.1% to 20%
Soundness (Na ₂ SO ₄)	IS 2386 (Part 5)			0.1% to 20%
Abrasion Value	IS 2386 (Part 4)			0.1% to 60%
Bulk Density	IS 2386 (Part 3)			1.0 kg/l to 3.0 kg/l
Organic Impurity	IS 2386 (Part 2)			Qualitative
6.	Concrete (Hardened concrete)	Compressive Strength	IS 516	5 Mpa to 80 Mpa
		Split Tensile Strength	IS 5816	0.1 N/mm ² to 20 N/mm ²
		Permeability Test	DIN 1048 (Part 5)	0.1 mm to 25 mm

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7.	Admixture	Water Content	IS 9103	0.1% to 90%
		Time of setting	IS 8142	15 minute to 1200 minute
		Compressive strength	IS 516	5 N/mm ² to 80 N/mm ²
		Length change	IS 1199	0.001% to 1%
		Slump	IS 1199	25 mm to 200mm
		Flexural Strength	IS 516	1 N/mm ² to 7 N/mm ²
8.	Cement (OPC/PPC)	Fineness	IS 4031 (Part 2)	150 m ² /kg to 500 m ² /kg
		Soundness I. Le-chatlier II. Autoclave	IS 4031 (Part 3) IS 4031 (Part -3)	0.5 mm to 40 mm 0.01% to 5.0%
		Consistency	IS 4031 (Part 4)	10% to 50%
		Initial Setting Time	IS 4031 (Part -5)	15 to 200 min.
		Final Setting Time	IS 4031 (Part -5)	15 to 600 min.
		Compressive Strength	IS 4031 (Part -6)	1 N/mm ² to 80 N/mm ²
		9.	Fly Ash	Fineness
Com. Strength	IS 1727			5 N/mm ² to 40 N/mm ²
Soundness(Autoclave)	IS 1727			0.01% to 2%
10.	Micro Silica	Material Retain on 45 micron IS sieve	IS 1727	1% to 25%
11.	Ceramic Tile	Water absorption	IS 13630 (Part 2)	0.01% to 20%
		Breaking Strength	IS 13630 (Part 6)	10 N to 5000 N
		Modules of Rupture	IS 13630 (Part 6)	5 N/mm ² to 60 N/mm ²
		Hardness	IS 13630 (Part 13)	1 to 9 mhos scale
		Resistance to stain	IS 13630 (Part 7)	Qualitative
		Resistance to household chemical	IS 13630 (Part 8)	Qualitative
12.	Cement Concrete tile	Wet Transverse Strength	IS 1237	0.1 N/m ² to 20 N/m ²
		Water absorption	IS 13801 IS 1237	2% to 25%
		Straightness	IS 13801 IS 1237	Upto 1.0 mm

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		Perpendicular	IS 13801 IS 1237	01 mm to 1.0 mm
		Thickness	IS 13801 IS 1237	5 mm to 50 mm
		Resistance to Wear	IS 13801 IS 1237	0.1 mm to 20 mm
		Flatness	IS 13801 IS 1237	01 mm to 1 mm
13.	Bitumen (Bitumen & Bitumen Product)	Penetration	IS 1203	10 mm to 400 mm
		Softening Point	IS 1205	10°C to 200°C
		Flash Point	IS 1209	15°C to 400°C
		Binder content	IS 1209 IRC (SP11) APPENDEX 5	1% to 15%
14.	Stones (Sand Stone/ Marble, Kota Stone)	Water Absorption	IS 1124	0.02% to 0.50%
		Compressive Strength	IS 1121 (Part 1)	500 kg/cm ² to 2500 kg/cm ²
		Specific Gravity	IS 1124	1 to 3
		Resistance to wear	IS 1706	0.1 mm to 10 mm
III.	SOIL & ROCK			
1.	Soil, Rock, GSB & WMM	Free Swell Index	IS 2720 (Part 40)	Upto 600 %
		Heavy Compaction (OMC & MDD)	IS 2720 (Part 8)	MDD 1 g/cc to 3 g/cc OMC 1% to 20%
		Plastic limit	IS 2720 (Part 5)	Upto 80%
		Liquid limit	IS 2720 (Part 5)	Upto 80%
		C.B.R	IS 2720 (Part 16)	0.5% to 30%
		Particle Size Distribution	IS 2720 (Part 4)	0.075 mm to 40 mm
		Direct Shear Test (C & Ø Value)	IS 2720 (Part 13)	C to 0.10 kg/cm ² to 0.90 kg/cm ² Ø -15° to 45°

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2.	Bentonite	Marsh Viscosity	ASTM-D 6910 M-09	10 Sec to 100 Sec
		Liquid limit	IS 2720 (Part 5)	Upto 80%
		Sand content	IS 6186	0.1 to 10%
IV.	TOY AND SIMILAR PRODUCT			
1.	Toys- Safety aspects related to Mechanical and Physical properties	Small Parts Test	IS 9873 (Part 1) Cl. 5.2, ISO 8124 (Part 1)	Qualitative
		Shape and Size	IS 9873 (Part 1) Cl. 5.3, ISO 8124 (Part 1)	Qualitative
		Small Balls Test	IS 9873 (Part 1) Cl. 5.4, ISO 8124 (Part 1)	Qualitative
		Pompoms	IS 9873 (Part 1) Cl. 5.5, ISO 8124 (Part 1)	Qualitative
		Pre-school play figures	IS 9873 (Part 1) Cl. 5.6, ISO 8124 (Part 1)	Qualitative
		Accessibility of Part or component	IS 9873 (Part 1) Cl. 5.7, ISO 8124 (Part 1)	Qualitative
		Sharp-Edge Test	IS 9873 (Part 1) Cl. 5.8, ISO 8124 (Part 1)	Qualitative
		Kinetic energy and Wall Impact Test	IS 9873 (Part 1) Cl. 5.15 ISO 8124 (Part 1)	1 J/m ² to 5000 J/m ²
		Free-wheeling Facility and Brake performance Test	IS 9873 (Part 1) Cl. 5.16 ISO 8124 (Part 1)	Qualitative
		Folding or Sliding Mechanisms	IS 9873 (Part 1) Cl. 5.22 ISO 8124 (Part 1)	Qualitative
		Drop Test	IS 9873 (Part 1) Cl. 5.24.2 ISO 8124 (Part 1)	Qualitative
		Tension Test	IS 9873 (Part 1) Cl. 5.24.6 ISO 8124 (Part 1)	Qualitative
		Compression test	IS 9873 (Part 1) Cl. 5.24.7 ISO 8124 (Part 1)	Qualitative

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		Flexure Test	IS 9873 (Part 1) Cl. 5.24.8 ISO 8124 (Part 1)	Qualitative
		Static Strength for toys scooters	IS 9873 (Part 1) Cl. 5.26 ISO 8124 (Part 1)	Qualitative
		Impact test for Magnets	IS 9873 (Part 1) Cl. 5.33 ISO 8124 (Part 1)	Qualitative
		Soaking test for Magnet	IS 9873 (Part 1) Cl. 5.34 ISO 8124 (Part 1)	Qualitative
		Projectile Range	IS 9873 (Part 1) Cl. 5.35 ISO 8124 (Part 1)	Qualitative
		Tip assessment of rigid projectiles	IS 9873 (Part 1) Cl. 5.36 ISO 8124 (Part 1)	Qualitative
		Length of Suction cup projectiles	IS 9873 (Part 1) Cl. 5.37 ISO 8124 (Part 1)	10 mm to 300 mm
2.	Safety of Toys Swings, Slides & Similar activity toys for Indoor & Outdoor Family Domestic Use	Maximum Height	IS 9873 (Part 4) Cl. 4.1 ISO 8124 (Part 4)	Upto 3000 mm
		Stability	IS 9873 (Part 4) Cl. 6.1.1 Cl. 6.1.3 Cl. 6.1.5 ISO 8124 (Part 4)	Qualitative
		Static Strength	IS 9873 (Part 4) Cl. 6.2, ISO 8124 (Part 4)	Qualitative
		Head and neck entrapment	IS 9873 (Part 4) Cl.6.5, ISO 8124 (Part 4)	Qualitative
		Toggle Test	IS 9873 (Part 4) Cl.6.6, ISO 8124 (Part 4)	Qualitative
		Protrusions	IS 9873 (Part 4) Cl.6.7, ISO 8124 (Part 4)	Qualitative
		Durability test for suspension connectors and means of suspensions	IS 9873 (Part 4) Cl.6.8, ISO 8124 (Part 4)	Qualitative