

Laboratory Testing Laboratory, M D Safety Equipment's Private Limited, C16/17,  
MIDC Industrial Area, Hingna, Nagpur, Maharashtra

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7573

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Validity 12.07.2018 to 11.07.2020

Last Amended on 19.11.2018

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.	METALS & ALLOYS			
1.	<b>Carbon Steel</b>	Carbon	IS 228(Part 1): 1987 (RA 2012) Amd-01	0.05 % to 2.5 %
		Silicon	IS 228 (Part 8): 1989 (RA 2014)	0.05 % to 2.0 %
		Manganese	IS 228 (Part 2): 1987 (RA 2012)	0.1 % to 3.0 %
		Sulphur	IS 228 (Part 9): 1989 (RA 2014)	0.01 % to 0.25 %
		Phosphorus	IS 228 (Part 3): 1987 (RA 2012)	0.01 % to 0.5 %
2.	<b>Stainless Steel</b>	Carbon	IS 228 (Part 1): 1987 (RA 2012) Amd-01	0.01 % to 1.0 %
		Silicon	IS 228 (Part 8): 1989 (RA 2014)	0.05 % to 2.0 %
		Manganese	IS 228 (Part 2): 1987 (RA 2012)	0.1 % to 3.0 %
		Sulphur	IS 228 (Part 9): 1989 (RA 2014)	0.01 % to 0.25 %
		Phosphorus	IS 228 (Part 3): 1987 (RA 2012)	0.01 % to 0.35 %
		Chromium	IS 228 (Part 6): 1987 (RA 2014)	0.1 % to 20.0 %
		Nickel	IS 228 (Part 5): 1987 (RA 2014)	0.1 % to 20.0 %
		Molybdenum	IS 228 (Part 7): 1987 (RA 2012)	0.5 % to 5.0 %

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Convenor

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Program Manager

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II.	<b>BUILDING MATERIALS</b>			
1.	<b>Cement (OPC, PPC, PSC)</b>	Loss on Ignition	IS 4032:1985 (RA 2014)	0.2 % to 15 %
		Silica as SiO <sub>2</sub>	IS 4032:1985 (RA 2014) Amd-02	5.0 % to 30 %
		Alumina as Al <sub>2</sub> O <sub>3</sub>	IS 4032:1985 (RA 2014) Amd-02	0.5 % to 15 %
		Iron Oxide as Fe <sub>2</sub> O <sub>3</sub>	IS 4032:1985 (RA 2014) Amd-02	0.5 % to 10 %
		Calcium as CaO	IS 4032:1985 (RA 2014) Amd-02	1.0 % to 70 %
		Magnesium as MgO	IS 4032:1985 (RA 2014) Amd-02	0.5 % to 10 %
		Sulphuric anhydride as SO <sub>3</sub>	IS 4032:1985 (RA 2014) Amd-02	0.1 % to 10 %
2.	<b>Concrete Admixture</b>	pH	IS 9103:1999 (RA 2013)	2 to 12
		Ash Content	IS 9103:1999 (RA 2013)	5 % to 30 %
		Relative Density	IS 9103:1999 (RA 2013)	1 to 1.5
		Dry Material Content	IS 9103:1999 (RA 2013)	5 % to 50 %
		Chloride Iron Content	IS 9103:1999 (RA 2013)	0.010 % to 0.10 %
3.	<b>Bentonite</b>	pH	IS 6186: 1996 (RA 2010)	2 to 12
III.	<b>SOIL AND ROCK</b>			
1.	<b>Soil</b>	pH	IS 2720 (Part 26): 1972 (RA 2015)	5 to 14
		Sulphate	IS 2720 (Part 27): 1977 (RA 2006)	0.05 – 1.5
		Organic Impurities	IS 2720 (Part 22): 1978 (RA 2015)	Qualitative
2.	<b>Micro Silica</b>	Moisture	IS 15388: 2003 (RA 2012)	0.1 % to 10.0 %
		Loss on Ignition	IS 1727:1967 (RA 2008)	0.5 % to 10 %
		SiO <sub>2</sub>	IS 1727:1967 (RA 2008)	5.0 % to 100.0 %

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IV.	<b>WATER</b>			
1.	<b>Construction Water</b>	Total Dissolved Solid	IS 3025 (Part 16): 1984 (RA 2012) Amd-01	10 mg/l to 20000 mg/l
		Volatile Residue (organic)	IS 3025 (Part 18): 1984 (RA 2012) Amd-01	1.0 mg/l to 2000 mg/l
		Fixed Residue (inorganic)	IS 3025 (Part 18): 1984 (RA 2012) Amd-01	1.0 mg/l to 20000 mg/l
		Total Suspended Solid	IS 3025 (Part 17): 1984 (RA 2012) Amd-01	5.0 mg/l to 3000 mg/l
		pH value	IS 3025 (Part 11): 1983 (RA 2012) Cl.2	2 to 12
		Chloride	IS 3025 (Part 32): 1988 (RA 2014) Cl.2	0.5 mg/l to 5000 mg/l
		Sulphate	IS 3025 (Part 24): 1986 (RA 2014)	0.01 mg/l to 1000 mg/l
		Volume of 0.02N H <sub>2</sub> SO <sub>4</sub> required to neutralize 100 ml sample of water using methyl orange (Alkalinity)	IS 3025 (Part 23): 1986 Cl.8.1	0.1 ml to 50 ml
		Volume of 0.02N NaOH required to neutralize 100 ml sample of water using phenolphthalein (Acidity)	IS 3025 (Part 22): 1986 (RA 2003) Cl.8.1 (RA 2014) Amd-02	0.1 ml to 25 ml

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**MECHANICAL TESTING**

I.	<b>BUILDINGS MATERIAL</b>			
1.	<b>Aggregate (Fine)</b>	Sieve Analysis ( 150 µm to 4.75 mm,)	IS 2386 (Part 1): 1963 (RA 2016) Amd. 4	150 Micron to 4.75 mm (0.1 % to 100 %)
		Specific gravity	IS 2386 (Part 3): 1963 (RA 2016) Amd. 4	2.00 to 4.00
		Water absorption	IS 2386 (Part 3): 1963 (RA 2016) Amd. 4	0.1 % to 5.0 %
		Particle finer than 75 micron	IS 2386 (Part 1): 1963 (RA 2016)	0.0 to 20.0 %
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2016) Amd. 4	1 kg/lit to 4 kg/lit
		Organic Impurities Test & Deleterious Materials	IS 2836 (Part 2): 1963 (RA 2016) Amd. 1	Qualitative
		2.	<b>Aggregate (Coarse)</b>	Sieve Analysis
Specific gravity	IS 2386 (Part 3): 1963 (RA 2016) Amd. 4			2.00 to 4.00
Water absorption	IS 2386 (Part 3): 1963 (RA 2016) Amd. 4			0.1 % to 20.0 %
Flakiness Index	IS 2386 (Part 1): 1963 (RA 2016) Amd-04			1 % to 50 %
Elongation Index	IS 2386 (Part 1): 1963 (RA 2016) Amd-04			1 % to 50 %
Impact Value	IS 2386 (Part 4): 1963 (RA 2016) Amd-03			1 % to 50 %
Crushing Value	IS 2386 (Part 4): 1963 (RA 2016) Amd-03			1 % to 50 %
Los Angles Abrasion Value	IS 2386 (Part 4): 1963 (RA 2016) Amd-03			1% to 60%

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		10% Fine Value	IS 2386 (Part 4): 1963 (RA 2016) Amd-03	1 ton to 50 ton
		Bulk Density	IS 2386 (Part 3): 1963 (RA 2016) Amd. 4	1.00 Kg/l to 4.00 Kg/l
		Deleterious Materials	IS 2836 (Part 1&2): 1963 (RA 2016) Amd. 4 & 1	0.1 % to 10%
3.	<b>Cement OPC, PPC, Slag Cement</b>	Consistency	IS 4031 (Part 4): 1988 (RA 2009)Amd. 2	23 % to 40 %
		Initial Setting Time	IS 4031 (Part 5): 1988 (RA2009) Rev-1Amd. 2	30 min to 500 min
		Final Setting Time	IS 4031 (Part 5): 1988 (RA 2009) Rev-1Amd. 2	30 min to 600 min
		Fineness by Blain Air Permeability	IS 4031 (Part 2): 1999 (RA 2008) Rev-2Amd. 2	200 m <sup>2</sup> /kg to 600 m <sup>2</sup> /kg
		Soundness by Lechatlier	IS 4031(Part 3): 1988 (RA 2014) Amd. 2	0.1 mm to 10 mm
		Soundness by Autoclave	IS 4031 (Part 3): 1988 (RA 2014) Amd. 2	0.01 % to 2.0 %
		Compressive Strength 72 ± 1hrs 168 ± 2hrs 678± 4hrs	IS 4031 (Part 6): 1988 (RA 2009) Amd. 4	5 Mpa to 70 Mpa
		Density	IS 4031 (Part 11): 1988 (RA 2009)	2.0 gm/cc to 3.3 gm/cc
4.	<b>Fly Ash</b>	Fineness Blain Method	IS 1727: 1967 (RA 2008) Amd. 2	100 m <sup>2</sup> /kg to 600 m <sup>2</sup> /kg
		Residue 45 Micron (Wet Sieving)	IS 1727: 1967 (RA 2008) Amd. 2	0 to 100 %
		Compressive Strength	IS 1727:1967 (RA 2008) Amd. 2	5 N/mm <sup>2</sup> to 40 N/mm <sup>2</sup>
		Soundness Autoclave Expansion	IS 1727: 1967 (RA 2008) Amd. 2	(-) 0.05 % to 2.0%
		Specific Gravity	IS 1727: 1967 (RA 2008) Amd. 2	1 to 3

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5.	Concrete (Cube, Core & Beam)	Compressive Strength	IS 516:1959 (RA2013) Amd. 2	5 N/mm <sup>2</sup> to 100 N/mm <sup>2</sup>
		Flexural Strength	IS 516:1959 (RA 2013) Amd. 2	2 N/mm <sup>2</sup> to 10 N/mm <sup>2</sup>
6.	Concrete Admixture	Water content	IS 1199:1959 (RA 2013)	0.5 % to 20 %
		Compressive strength	IS 516:1959 (RA 2013) Amd. 2	5 N/mm <sup>2</sup> to 50 N/mm <sup>2</sup>
		Flexural strength	IS 516:1959 (RA 2013) Amd. 2	2 N/mm <sup>2</sup> to 15 N/mm <sup>2</sup>
7.	Fresh Concrete	Slump	IS 1199:1959 (RA2013)	Upto 200 mm
8.	Bricks	Dimension (a) Length (b) Width (c) height	IS 1077:1992 (RA 2011) Amd-1	10 mm to 5000 mm
		Water Absorption	IS 3495 (Part 2): 1992 (RA 2011)	1 % to 50 %
		Compressive Strength	IS 3495 (Part 1): 1992 (RA 2011)	10 kg/cm <sup>2</sup> to 200 kg/cm <sup>2</sup>
		Efflorescence	IS 3495 (Part 3): 1992 (RA 2011)	Qualitative
		Compressive strength	IS 15658:2006 (RA 2016)	10 N/mm <sup>2</sup> to 75 N/mm <sup>2</sup>
		Water absorption	IS 15658:2006 (RA 2016)	1.0 % to 25.0 %
		10.	Soil	Natural Moisture Content
Liquid Limit	IS 2720 (Part 5): 1985 (RA 2015) Amd. 1			20 % to 200 %
Plastic limit, %	IS 2720 (Part 5): 1985 (RA 2015) Amd. 1			10 % to 80 %
Specific gravity	IS 2720 (Part 3 & Sec 1): 1980 (RA 2011)			1.0 to 4.0
Compaction Test :- Light Compaction	IS 2720 (Part 7): 1980 (RA 2011) Amd. 2			MDD 0.8 gm/cc to 4.0 gm/cc
Heavy Compaction	IS 2720 (Part 8): 1983 (RA 2015)			OMC 1 % to 50%

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		Shrinkage Limit	IS 2720 (Part 6): 1972 (RA 2016)	1.0 % to 30.0 %
		California Bearing Ratio	IS 2720 (Part 16): 1987 (RA 2011)	1 % to 50 %
		Sieve Analysis & Hydrometer	IS 2720 (Part 4): 1985 (RA 2015)	80 mm to 2 micron
		Free Swell Index	IS 2720 (Part 40): 1977 (RA 2011)	10 % to 300 %
<b>II.</b>	<b>MECHANICAL PROPERTIES OF METALS</b>			
<b>1.</b>	<b>HSD Bar / TMT Bar</b>	Elongation	IS 1608:2018	5 % to 40 %
		Tensile strength N/mm <sup>2</sup>	IS 1608:2018	20 kN to 1000 kN
		Yield stress/0.2% proof, N/mm <sup>2</sup>	IS 1786:2008 (RA 2013) Amd-3	20 kN to 1000 kN
		Bend	IS 1786:2008 & amp; IS 1599:2012	Qualitative (Mandrel Dia. 32, 40, 48, 64, 80, 125, 160, 180) mm
		Re bend	IS 1786: 2008	Qualitative (Mandrel Dia. 40, 50, 84, 112, 140, 175, 224 & 252) mm
		Mass, per meter	IS 1789:2008	0.1 kg/m to 20 kg/m