

Laboratory

National Testing Laboratory Pvt. Ltd., Pocket-A Commercial Complex
Raut City, Cantt Road, Khagaul, Patna, Bihar

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5245 (in lieu of T-3238, & T-3239)

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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
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CHEMICAL TESTING

I. BUILDING MATERIALS				
1.	Cement (OPC, PPC, Portland Slag Cement, Clinker)	SiO ₂	IS 4032 : 1985 (RA 2014)	5.0 % to 30%
		Loss on Ignition	IS 4032 : 1985 (RA 2014)	0.5 % to 10 %
		Al ₂ O ₃	IS 4032 : 1985 (RA 2014)	0.5 % to 10 %
		Fe ₂ O ₃	IS 4032 : 1985 (RA 2014)	0.5 % to 10 %
		CaO	IS 4032 : 1985 (RA 2014)	25 % to 70 %
		MgO	IS 4032 : 1985 (RA 2014)	0.5 % to 10 %
		SO ₃	IS 4032 : 1985 (RA 2014)	0.1 % to 10 %
		Insoluble Residue	IS 4032 : 1985 (RA 2014)	0.5 % to 40 %
		Total Chloride	IS 4032 : 1985 (RA 2014)	0.001 % to 0.5 %
		Sodium Oxide(Na ₂ O)	IS 4032 : 1985 (RA 2014)	0.01 % to 1 %
Potassium Oxide (K ₂ O)	IS 4032 : 1985 (RA 2014)	0.01 % to 1 %		
2.	Pozollana Material (fly ash) & Micro Silica	SiO ₂	IS 1727 : 1967 (RA 2013)	20 % to 80 %
		Loss on Ignition	IS 1727 : 1967 (RA 2013)	0.5 % to 10 %
		Al ₂ O ₃	IS 1727 : 1967 (RA 2013)	0.5 % to 35 %
		Fe ₂ O ₃	IS 1727 : 1967 (RA 2013)	0.5 % to 10 %
		CaO	IS 1727 : 1967 (RA 2013)	0.5 % to 20%
		MgO	IS 1727 : 1967 (RA 2013)	0.5 % to 7.5 %
		SO ₃	IS 1727 : 1967 (RA 2013)	0.1 % to 6 %
		Total Chloride	IS 4032 : 1985 (RA 2014)	0.001 % to 0.5 %
		Available Sodium Oxide(Na ₂ O)	IS 3812(Part-1) 2013	0.01 % to 4.5 %
		Available Potassium Oxide(K ₂ O)	IS 3812(Part-1) 2013	0.01 % to 4.5 %
3.	Concrete admixture	pH	IS 9103 : 1999 (RA 2013)	1 to 12
		Dry Material content	IS 9103 : 1999 (RA 2013)	5 % to 50 %
		Ash Content	IS 9103 : 1999 (RA 2013)	0.1 % to 30 %
		Relative Density	IS 9103 : 1999 (RA 2013)	0.8 to 1.5

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		Chloride Ion content	IS 6925 : 1973 (RA 2013) CI-4	0.001 % to 0.5 %
4.	Hardened Concrete and Aggregates	Chloride	BS : 1881(Part-124) 1988 BS : 812(Part-117) 1988	0.001 % to 0.5 %
		Sulphate	BS : 1881(Part-124) 1988 BS : 812(Part-118) 1988	0.01 % to 10 %
		Sodium Oxide	BS : 1881(Part-124) 1988	0.01 % to 1 %
		Potassium Oxide	BS:1881(Part-124) 1988	0.01 % to 1 %
5.	Micro Silica	Moisture	IS 15388 : 2003 (RA 2012)	0.1 % to 10.0 %
6.	Bentonite	pH	IS 6186 : 1986 (RA 2003)	5 to 14
7.	Coarse Aggregate / Fine Aggregate	Alkali Aggregate Reactivity 1.Reduction in alkalinity 2.Total Dissolved Silica	IS: 2386 (PART7)/1963 (RA 2011) (Cl. 3.9) (Cl. 3.8)	0.1 milimole/ltr to 5 milimole/ltr 0.1 milimole/ltr to 5 milimole/ltr
II.	METAL & ALLOYS			
1.	Ferrous Low Alloys Steel, Plain carbon Steel	Carbon	IS 228 (Part-1) 1987 (RA 2008)	0.050 % to 2.50 %
		Sulphur	IS 228 (Part-9) 1989 (RA 2009)	0.010 % to 0.50%
		Silicon	IS:228(Part-8)-1989 (RA 2009)	0.10 % to 2.00 %
		Manganese	IS:228(Part-2)-1987 (RA 2008)	0.05 % to 2.0 %
		Phosphorus	IS:228(Part-3)-1987 (RA 2008)	0.010 % to 0.50 %
		Nickel	IS:228(Part-5)-1987 (RA 2009)	0.05 % to 2.00 %
		Molybdenum	IS:228(Part-7)-1990 (RA 2012)	0.10 % to 1.00 %
		Chromium	IS:228(Part-6)-1987 (RA 2009)	0.10 % to 2.00 %
		Copper	IS:228(Part-15)-1992 (RA 2009)	0.05 % to 2.0 %

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2.	Stainless Steel	Carbon	IS 228 (Part-1) 1987 (RA 2008)	0.02 % to 0.50 %
		Sulphur	IS 228 (Part-9) 1989 (RA 2009)	0.010 % to 0.10%
		Silicon	IS:228(Part-8)-1989 (RA 2009)	0.10 % to 2.50 %
		Manganese	IS:228(Part-2)-1987 (RA 2008)	0.10 % to 2.50 %
		Phosphorus	IS:228(Part-3)-1987 (RA 2008)	0.010 % to 0.10%
		Nickel	IS:228(Part-5)-1987 (RA 2009)	0.8 % to 15.00 %
		Molybdenum	IS:228(Part-7)-1990 (RA 2012)	0.2 % to 12.00 %
		Chromium	IS:228(Part-6)-1987 (RA 2009)	0.5 % to 25.00 %
		Copper	IS:228(Part-15)-1992 (RA 2009)	0.5 % to 2.50 %
3.	Metallic Coating (Ferrous & non-ferrous)	Anodic Coating, micron	IS:5523-1983 (RA 2010)	5 micron to 40 micron
		Powder Coating, micron	IS 6012 : 1992 (RA 2010)	10.0 micron to 200 micron
		Zinc Coating	IS 6745 : 1972 (RA 2010)	20.0 g/m ² to 2000 g/m ²
		Uniformity of Zinc Coating	IS 2633 : 1986 (RA 2010)	Qualitative
		Adhesion Test	IS 2629 : 1985 (RA 2010)	Qualitative
III.	WATER			
1.	Drinking Water	Colour Hazan units	IS 3025 (Part-4) : 1983 (RA 2012) Platinum Cobalt (visual)	1 Hazen to 50 Hazen Units
		Odour	IS 3025 (Part-5) : 1983 (RA 2012)	Qualitative
		Taste	IS 3025 (Part-7 & 8) : 1984 (RA 2012)	Qualitative

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		Turbidity	IS 3025 (Part-10) : 1984 (RA 2012)	1 NTU to 500 NTU
		Total Dissolved Solid	IS 3025 (Part-16) 1984 (RA 2012)	25 mg/l to 15000 mg/l
		pH value	IS 3025 (Part-11) 1983 (RA 2012)	0.1 to 14.0
		Chloride	IS 3025 (Part-32)1988 (RA 2009)	10 mg/l to 2000 mg/l
		Total Hardness (as CaCO ₃)	IS 3025 (Part-21) 2009	20 mg/l to 5000 mg/l
		Total alkalinity as Calcium carbonate,	IS 3025 (Part-23) 1986 (RA 2009)	10 mg/l to 5000 mg/l
		Residual Free Chlorine	IS 3025 (Part-26) 1986 (RA 2009)	0.1 mg/l to 10 mg/l
		Iron(Fe)	IS 3025 (Part-53) 2003 (RA 2009)	0.15 mg/l to 100 mg/l
		Sodium(as Na)	IS 3025 (Part-45) 1993 (RA 2009)	1 mg/l to 2000 mg/l
		Potassium (as K)	IS 3025 (Part-45) 1993 (RA 2009)	1 mg/l to 2000 mg/l
2.	Construction Water	Total Dissolved Solid	IS 3025 (Part-16) 1984 (RA 2012)	50 mg/l to 10000 mg/l
		Organic Matter	IS 3025 (Part-18) 1984 (RA 2012))	10 mg/l to 2000 mg/l
		Inorganic Matter	IS 3025 (Part-18) 1984 (RA 2012)	10 mg/l to 10000 mg/l
		Total suspended solid	IS 3025 (Part-17) 1986 (RA 2012)	5 mg/l to 5000 mg/l
		pH value	IS 3025 (Part-11) 1983 (RA 2012)	0.3 to 12.0
		Chloride	IS 3025 (Part-32) 1988 (RA 2009))	5 mg/l to 2500 mg/l
		Sulphate	IS 3025 (Part-24) 1986 (RA 2003)	10 mg/l to 1000 mg/l

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		Alkalinity(Amount of 0.02N H ₂ SO ₄ Required to Neutralize 100 ml Sample of water Using Mixed Indicator,)	IS 456-2000(Clause 5.4) (RA 2011)	0.5 ml to 100 ml
		Acidity(Amount of 0.02N NaOH Required to Using Phenolphthalein Indicator)	IS 456 : 2000(Clause 5.4) (RA 2011)	0.1 ml to 50ml

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MECHANICAL TESTING

I. BUILDING MATERIALS						
1.	Cement (OPC, PSC, PPC)	Setting time (a) Initial (b) Final	IS 4031(Part-5):1988 (RA 2014)	10 Min to 150 Min 150 Min to 600 min		
		Soundness (a) Lechatlier (b) Autoclave	IS 4031(Part-3):1988 (RA 2014)	0.5 mm to 10 mm -0.05 % to 2.0%		
		Compressive Strength (a) 24 ± ½ Hrs (b) 72 ± 1Hrs (c) 168 ± 2Hrs (d) 678 ± 4Hrs	IS 4031(Part-6):1988 (RA 2014)	5 Mpa to 70 Mpa		
		Fineness Blain's Method	IS 4031(Part-2):1999 (RA 2013)	100 m ² /kg to 600 m ² /kg		
		Consistency	IS 4031(Part-4):1988 (RA 2014)	20 % to 40%		
		Drying shrinkage (For PPC)	IS 4031(Part-10):1988 (RA 2014)	0.01 % to 1.0 %		
		Density	IS 4031(Part-11):1988 (RA 2014)	2 g/cc to 3.5 g/cc		
		2.	Pozzolana Material	Fineness (a) Blain Method	IS 1727:1967 (RA 2013)	100 m ² /kg to 600 m ² /kg
				Residue 45 micron (Wet Sieving)	IS 1727:1967 (RA 2013)	0 to 100%
				Lime Reactivity	IS 1727:1967 (RA 2013)	2 N/mm ² to 20 N/mm ²
Compressive strength	IS 1727:1967 (RA 2013)			5 N/mm ² to 40 N/mm ²		
Soundness Autoclave expansion	IS 1727:1967 (RA 2013)			-0.05 % to 2.0%		
		Specific Gravity	IS 1727:1967 (RA 2013)	1 to 3		

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3.	Brick (Burnt Clay Brick, Fly Ash Brick, Fly Ash Lime Brick)	Dimension (a) Length (b) Width (c) Height	IS 13757:1993 (RA 2011) IS 12894:2002 (RA 2012) IS 1077 :1992 (RA 2011)	Upto 5000mm Upto 3000mm Upto 2000mm
		Water absorption	IS 3495(Part-2):1992 (RA 2011)	1 % to 50%
		Efflorescence	IS 3495(Part-3):1992 (RA 2011)	Qualitative
		Compressive strength	IS 3495(Part-1):1992 (RA 2011)	20 kg/cm ² to 400 kg/cm ²
4.	Coarse Aggregate	Flakiness Index	IS 2386 (Part-1):1963 (RA 2011)	10 % to 60%
		Deleterious Materials	IS 2386(Part-1):1963 (RA 2011)	0.1 % to 10%
		Bulk Density	IS 2386 (Part-3):1963 (RA 2011)	1 gm/cc to 3 gm/cc
		Specific Gravity	IS 2836(Part-3) (RA 2011)	2 to 3
		Water absorption	IS 2386 (Part-3): 1963 (RA 2011)	0.2 % to 5%
		Crushing Value	IS 2386(Part -4):1963, (RA 2011)	10 % to 60%
		Impact value	IS 2386(Part -4):1963 (RA 2011)	10 % to 60%
		Los Angeles Abrasion Value	IS 2386(Part -4):1963 (RA 2011)	10 % to 60%
		10% fine value	IS 2386(Part -4):1963 (RA 2011) BS 812(Part -111)-1990	5 Tonnes to 50 Tonnes
		Soundness	IS 2386(Part -5):1963 (RA 2011)	1 % to 15%
		Sieve Analysis	IS 2386(Part -1):1963 (RA 2011)	0 to 100%
Elongation Index	IS 2386 (Part -1):1963 (RA 2011)	10 % to 60%		

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		Organic Impurities test	IS 2386(Part -2):1963 (RA 2011) (CPWD Spec.)	Qualitative
5.	Fine Aggregate	Organic Impurities test	IS 2386(Part -2):1963 (RA .2011)	Qualitative
		Water absorption	IS 2386 (Part -3): 1963 (RA 2011)	0.2 % to 5%
		Silt content, %	IS 2386(Part -2):1963 (RA 2011)	0 to 20 %
		Deleterious Materials	IS 2386(Part -1&2):1963 (RA 2011)	0.1 % to 15%
		Bulk Density	IS 2386 (Part -3):1963 (RA 2011)	1 gm/cc to 3 gm/cc
		Soundness	IS 2386(Part -5):1963 (RA 2011)	1 % to 15%
		Sieve Analysis	IS 2386(Part -1):1963 (RA 2011)	0 to 100%
		Specific Gravity	IS 2836(Part -3) (RA 2011)	2 to 3
6.	Bentonite	Free Swell Index	IS 2720(Part -40) 1977 (RA 2011)	10 % to 700%
		Liquid limit	IS 2720(Part -5):1985 (RA 2010)	200% to 500%
		Density	IS 2720(Part-3):1980 (RA 2011)	0.95 gm/cc to 1.5 gm/cc
		Sand Content	IS 6186:1986 (RA 2010)	0 to 20%
		Marsh cone Viscosity	ASTM D6910-2009	10 Seconds to 200 Seconds
		Gel formation index	IS 6186:1986 (RA 2010)	Qualitative
7.	Concrete			
	a) Hardened Concrete	Compressive strength	IS 516:1959 (RA 2008)	5 N/mm ² to 100 N/mm ²
		Drying Shrinkage	BS 1881 (Part-122):1983	0.001 % to 1 %
		Moisture Movement	BS 1881(Part-122):1983	0.001 % to 1 %
		Water Absorption	BS 1881(PART-122):1983	0.1 % to 15%
		Flexural Strength	IS 516:1959 (RA 2013)	2 N/mm ² to 15 N/mm ²

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	b) Fresh Concrete/ Admixture	Air content	IS 1199:1959 (RA 2013)	0.1 % to 10%
		Water content	IS 9103:1999 (RA 2013)	60 % to 85%
		Bleeding Test	IS 9103:1999 (RA 2013) (Annex-d)	0.5 % to 10%
		Setting time (Initial and Final)	IS 8142:1976 (RA 2015)	150 minutes to 800 minutes
8.	Paver Blocks	Compressive Strength	IS 15658:2006 (RA 2011)	10 N/mm ² to 100 N/mm ²
		Water absorption	IS 15658:2006 (RA 2011)	2 % to 20%
		Dimension Length Width Thickness	IS 15658:2006 (RA 2011)	200 mm to 600 mm 200 mm to 400mm 20 mm to 200mm
		Abrasion Resistance (Abrasive wear)	IS 15658:2006 (RA 2011)	200 mm ³ to 5000 mm ³
9.	Cement concrete Tiles	Thickness of wearing Layer	IS 1237:2012 (RA 2012) IS 13801:1993 (RA 2011)	1.0 mm to 25mm
		Wet Transverse Strength	IS 1237:2012 (RA 2012) IS 13801:1993 (RA 2011)	Upto 20 N/mm ²
		Water absorption	IS 13801:1993 (RA 2011) IS 1237:2012 (RA 2012)	2 % to 20 %
		Dimension Length Width Thickness	IS 1237:2012 (RA 2012) IS 13801:1993 (RA 2011)	200 to 600mm 200 to 400mm 15 to 60mm
		Abrasion Resistance	IS 1237:2012 (RA 2012) IS 13801:1993 (RA 2011)	0.5 mm to 25 mm
10.	Micro silica	Sieve analysis at 45 micron	IS 1727:1967 (RA 2013)	0 to 25%
		Compressive strength	IS 1727:1967 (RA 2013)	0.5 N/mm ² to 60 N/mm ²
11.	Ceramic products (Glazed Tile, Unglazed Tile, Vitrified Tile)	Dimension & Surface Quality	IS 13630 (PART-1):2006 (RA 2011)	1 mm to 1000mm
		Thermal shock	IS 13630 (PART-5):2006 (RA 2011)	Qualitative
		Water absorption	IS 13630 (PART-2):2006 (RA 2011)	0.01 % to 30%

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		Modulus of rupture	IS 13630 (PART-6):2006 (RA 2011)	5 N/mm ² to 70 N/mm ²
		Breaking Strength	IS 13630(Part-6):2006 (RA 2011)	50 N to 5000 N
		Scratch Hardness	IS 13630:2006 (RA 2011)	1 Mohs to 9 Mohs
		Resistance to staining	IS 13630(Part-8):2006 (RA 2011)	Qualitative
		Resistance to house Hold chemical	IS 13630(Part-8):2006 (RA 2011)	Qualitative
		Resistance to acid/alkali	IS 13630(Part-8):2006 (RA 2011)	Qualitative
12.	Bitumen / Modified Bitumen	Penetration (at 25°C, 5 sec, 100 gm)	IS 1203:1978 (RA 2014)	10(1/10)mm to 300(1/10)mm
		Softening Point	IS 1205:1978 (RA 2014)	10 °C to 100 °C
		Flash point (open cup)	IS 1209:1978 (RA 2014)	100 °C to 400 °C
		Specific Gravity	IS 1202:1978 (RA 2013)	0.5 to 2.0
		Solubility in trichloroethylene	IS 1216:1978 (RA 2014)	50 % to 99.8%
13.	Flush Door Shutter	Glue adhesion Test	IS 2202(Part -1)1999 (RA 2011)	Qualitative
		End Immersion Test	IS 2202(Part -1):1999 (RA 2011)	Qualitative
		Knife Test	IS 2202(Part -1)1999 (RA 2011)	Qualitative
	Flush Door Shutter	Dimensions Length Width Thickness	IS 2202(Part -1)1999 (RA 2011)	1000 mm to 3000 mm 500 mm to 1500 mm 20 mm to 50 mm
II.	MECHANICAL PROPERTIES OF METALS			
1.	TMT (Reinforcement steel)	Elongation	IS 1608:2005 (RA 2006))	5 % to 40%
		Tensile Strength N/mm ²	IS 1608:2005 (RA 2006)	Upto 1000 KN

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		Yield Stress/0.2% Proof, N/mm ²	IS 1608:2005 (RA 2006)	Upto 1000 KN
		Bend	IS 1599:2012 (RA 2006)	Qualitative
		Re Bend	IS 1786:2008	Qualitative
		Mass, kg	IS 1786:2008	0.1 Kg to 20 Kg
		Bond Requirement (N/mm ² /mm)	IS 1786:2008 (RA 2013) IS 2770(Part-1):1967	5 kg/cm ² to 500 kg/cm ²
		Total Elongation at max force	IS 1608:2005 (RA 2006)	2 to 10%
2.	Structural Steel/Pipes & Steel Tubes	Elongation	IS 1608:2005 (RA 2006)	5 % to 50%
		Tensile Strength N/mm ²	IS 1608:2005 (RA 2006)	Upto 1000 KN
		Yield Stress/0.2% Proof, N/mm ²	IS 1608:2005 (RA 2006)	Upto 1000 KN
		Bend	IS 1599:2012, IS 2329:2005 (RA 2011)	Qualitative
		Dimension test, mm	IS 1730:1989 (RA 2009)	0.1 mm to 300 mm
		Mass, kg	IS 1732:1989 (RA 2009)	Upto to 100 Kg
3.		Steel pipes/tubes	Flattening Test	IS 2328:2005 (RA 2010)
4.	Splicing coupler	Slip test	IS 16172:2014	0.01mm to 1.0 mm
		Tensile test/Breaking load	IS 1608:2005 (RA 2011)	Upto 1000 KN
5.	Seven-Ply strand wire for Prestressed concrete	Breaking Load, KN	IS 14268:1995 (RA 2013) IS 1608:2005 (RA 2011)	Upto 1000 KN
		Elongation at break	IS 14268:1995 (RA 2013)	1 % to 10 %
		0.2% Proof Load	IS 1608:2005 (RA 2011)	Upto 1000 KN
		Lay length	IS 14268:1995 (RA 2013)	0.02 mm to 300 mm
		Mass	IS 14268:1995 (RA 2013)	Upto 15 Kg
		Modulus of Elasticity Test	IS 14268:1995 (RA 2013) IS 1608:2005 (RA 2011)	Upto 1000KN

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III.	SOIL AND ROCK			
1.	Soil	Proctor test (Light Compaction) MDD OMC	IS 2720(Part -7):1980 (RA 2011)	0.7 g/cc to 2.5 g/cc 1 % to 30 %
		Proctor test (Heavy Compaction) MDD OMC	IS 2720(Part -8):1983 (RA 2010)	0.7 g/cc to 2.5 g/cc 1% to 30 %
		Grain Size analysis	IS 2720 (Part-4):1985 (RA 2010)	0 to 100%
		Liquid limit	IS 2720(Part -5):1985 (RA 2010)	1 % to 50%
		Plastic limit	IS 2720(Part -5):1985 (RA 2010)	1 % to 50%
		CBR Value (Lab)	IS 2720(Part -16):1987 (RA 2011)	5 % to 80%
		Direct shear test Cohesion intercept C Value Internal friction ϕ value	IS 2720(Part -13):1986 (RA 2011)	0 to 0.5 kg/cm ² 5 to 50 degree
		Tri-axial Test Cohesion intercept C Value Internal friction ϕ value	IS 2720(Part -12):1981 (RA 2011)	0 to 0.5 kg/cm ² 1 to 20 degree
		Moisture Content	IS 2720(Part-2):1973 (RA 2010)	0.25 % to 50%