

<b>Laboratory</b>	<b>Independent Testing Laboratories, National Council for Cement and Building Materials, 34 km Stone, Delhi-Mathura Road (NH-2), Ballabgarh, Haryana</b>		
<b>Accreditation Standard</b>	<b>ISO/IEC 17025: 2005</b>		
<b>Discipline</b>	<b>Chemical Testing</b>	<b>Issue Date</b>	<b>04.10.2014</b>
<b>Certificate Number</b>	<b>T-0114</b>	<b>Valid Until</b>	<b>03.10.2016</b>
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<b>S.No.</b>	<b>Product / Material of Test</b>	<b>Specific Test Performed</b>	<b>Test Method Specification against which tests are performed</b>	<b>Range of Testing / Limits of Detection</b>
<b>I.</b>	<b>BUILDING MATERIALS</b>			
<b>1.</b>	<b>Clinker, Portland Cement, Blended Cement, Masonary Cement &amp; Granulated Blast Furnace Slag</b>	Loss on Ignition	IS 4032:1985 (RA 2009)	(-)4.00% to 10.00%
		SiO <sub>2</sub>	IS 4032:1985 (RA 2009)	12.00% to 40.00%
		Al <sub>2</sub> O <sub>3</sub>	IS 4032:1985 (RA 2009)	1.00% to 40.00%
		Fe <sub>2</sub> O <sub>3</sub>	IS 4032:1985 (RA 2009)	0.10% to 10.00%
		CaO	IS 4032:1985 (RA 2009)	25.00% to 70.00%
		MgO	IS 4032:1985 (RA 2009)	1.00% to 20.00%
		SO <sub>3</sub>	IS 4032:1985 (RA 2009)	0.20% to 7.00%
		Insoluble Residue	IS 4032:1985 (RA 2009)	0.15% to 40.00%
		Sulphur as Sulphide	IS 4032:1985 (RA 2009)	0.10% to 2.00%
		Free Lime	IS 4032:1985 (RA 2009)	0.05% to 10.00%
		Na <sub>2</sub> O/Water soluble Na <sub>2</sub> O	IS 4032:1985 (RA 2009)	0.05% to 3.00%
		K <sub>2</sub> O/Water soluble K <sub>2</sub> O	IS 4032:1985 (RA 2009)	0.02% to 3.00%
		Cl	IS 4032:1985 (RA 2009)	0.002% to 3.00%
		TiO <sub>2</sub>	IS 12423:1988 (RA 2009)	0.05% to 2.00%

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	<b>Clinker, Portland Cement, Blended Cement, Masonary Cement &amp; Granulated Blast Furnace Slag Clinker &amp; OPC</b>	P <sub>2</sub> O <sub>5</sub>	IS 12423:1988 (RA 2009)	0.05% to 2.00%
		Mn <sub>2</sub> O <sub>3</sub>	IS 12423:1988 (RA 2009)	0.05% to 2.00%
		Glass Content	IS 12089:1987	5% to 99%
		SiO <sub>2</sub>	IS 12803:1989 (RA 2008) (By XRF)	15.00% to 25.00%
		Al <sub>2</sub> O <sub>3</sub>	IS 12803:1989 (RA 2008) (By XRF)	2.50% to 6.50%
		Fe <sub>2</sub> O <sub>3</sub>	IS 12803:1989 (RA 2008) (By XRF)	2.00% to 6.00%
		CaO	IS 12803:1989 (RA 2008) (By XRF)	57.00% to 67.00%
		MgO	IS 12803:1989 (RA 2008) (By XRF)	1.00% to 7.00%
		SO <sub>3</sub>	IS 12803:1989 (RA 2008) (By XRF)	0.20% to 4.50%

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<b>2.</b>	<b>Pulverised Fuel Ash, Coal Ash</b>	Moisture	IS:3812 (Part 1):2013 (Annex-D)	0.01% to 5.0%
		Loss on Ignition	IS 1727:1967 (RA 2008)	0.20% to 15.00%
		SiO <sub>2</sub>	IS 1727:1967 (RA 2008)	15.00% to 70.00%
		MgO	IS 1727:1967 (RA 2008)	0.10% to 7.00%
		CaO	IS 1727:1967 (RA 2008)	0.50% to 25.00%
		Al <sub>2</sub> O <sub>3</sub>	IS 1727:1967 (RA 2008)	2.00% to 40.00%
		Fe <sub>2</sub> O <sub>3</sub>	IS 1727:1967 (RA 2008)	0.05% to 10.00%
		SO <sub>3</sub>	IS 1727:1967 (RA 2008)	0.05% to 10.00%
		Available alkalis as Na <sub>2</sub> O	IS 3812 (Part 1): 2013 (Annex-C)	0.02% to 5.0 %
		Cl	IS 4032:1985 (RA 2009)	0.002% to 0.500%
		TiO <sub>2</sub>	IS 12423:1988 (RA 2009)	0.05% to 3.500%
		P <sub>2</sub> O <sub>5</sub>	IS 12423:1988 (RA 2009)	0.05% to 2.000%
		Mn <sub>2</sub> O <sub>3</sub>	IS 12423:1988 (RA 2009)	0.05% to 2.000%
Reactive Silica	IS 3812 (Part 1): 2013 (Annex-B)	15.00% to 60.00%		

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3.	<b>Concrete Admixture</b>	Chloride	IS 6925:1973 (RA 2008)	0.02% to 5.00%
4.	<b>Aggregate</b>	Alkali Aggregate Reactivity:		
		a. Silica Release	IS 2386 (Part 7):1963 (RA 2011)	(10 to 100) millimoles/l
		b. Reduction in alkalinity	IS 2386 (Part 7):1963 (RA 2011)	(20 to 500) millimoles/l
5.	<b>Refractory</b>	Loss on Ignition	IS 1527:1972 (RA 2006)	0.50% to 5.00%
		SiO <sub>2</sub>	IS 1527:1972 (RA 2006)	12.00% to 35.00%
		Al <sub>2</sub> O <sub>3</sub>	IS 1527:1972 (RA 2006)	1.00% to 80.00%
		Fe <sub>2</sub> O <sub>3</sub>	IS 1527:1972 (RA 2006)	1.00% to 10.00%
		CaO	IS 1527:1972 (RA 2006)	0.5% to 30.00%
		MgO	IS 1527:1972 (RA 2006)	0.5% to 70.00%
		Na <sub>2</sub> O	IS 1527:1972 (RA 2006)	0.005% to 3.00%
		K <sub>2</sub> O	IS 1527:1972 (RA 2006)	0.002% to 3.00%
		Cl	IS: 4032:1985 (RA 2009)	0.002% to 1.00%
		P <sub>2</sub> O <sub>5</sub>	IS 12423: 1988 (RA 2009)	0.005% to 2.00%
		TiO <sub>2</sub>	IS 12423: 1988 (RA 2009)	0.005% to 5.000%

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<b>II.</b>	<b>ORES &amp; MINERALS</b>			
<b>1.</b>	<b>Limestone, Dolomite and Allied Materials</b>	Loss on Ignition	IS 1760 (Part 1):1991 (RA 2006)	1.00% to 45.00%
		SiO <sub>2</sub>	IS 1760 (Part 2):1991 (RA 2006)	0.20% to 30.00%
		Al <sub>2</sub> O <sub>3</sub>	IS 1760 (Part 3):1992 (RA 2006)	0.20% to 10.00%
		Fe <sub>2</sub> O <sub>3</sub>	IS 1760 (Part 3):1992 (RA 2006)	0.15% to 8.00%
		CaO	IS 1760 (Part 3):1992 (RA 2006)	5.00% to 55.00%
		MgO	IS 1760 (Part 3):1992 (RA 2006)	0.15% to 20.00%
		SO <sub>3</sub>	IS 4032 : 1985 (RA 2009)	0.04% to 5.00%
		Na <sub>2</sub> O	IS 4032 : 1985 (RA 2009)	0.005% to 3.00%
		K <sub>2</sub> O	IS 4032 : 1985 (RA 2009)	0.005% to 3.00%
		Cl	IS 1760(Part 5): 1991 (RA 2006)	0.002% to 0.500%
		Mn <sub>2</sub> O <sub>3</sub>	IS 12423:1988 (RA 2009)	0.005% to 2.000%
		TiO <sub>2</sub>	IS 12423:1988 (RA 2009)	0.005% to 2.000%
		P <sub>2</sub> O <sub>5</sub>	IS 12423:1988 (RA 2009)	0.005% to 2.000%

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	<b>Limestone, Dolomite and Allied Materials</b>	Free Silica	IS 1760 (Part 6):2001 (RA 2006)	0.20% to 10.00%
<b>2.</b>	<b>Bauxite</b>	Loss on Ignition	IS 2000 (Part 1):1985 (RA 2006)	0.25% to 30.00%
		SiO <sub>2</sub>	IS 2000 (Part 2):1985 (RA 2006)	0.50% to 20.00%
		Al <sub>2</sub> O <sub>3</sub>	IS 2000 (Part 3):1985 (RA 2006)	0.10% to 70.00%
		Fe <sub>2</sub> O <sub>3</sub>	IS 2000 (Part 4):1985 (RA 2006)	0.10% to 18.00%
		CaO	IS 2000 (Part 9):1989 (RA 2006)	0.10% to 5.00%
		MgO	IS 2000 (Part 9):1989 (RA 2006)	0.10% to 5.00%
		Na <sub>2</sub> O	IS 4032:1985 (RA 2009)	0.005% to 5.000%
		K <sub>2</sub> O	IS 4032:1985 (RA 2009)	0.005% to 5.000%
		TiO <sub>2</sub>	IS 2423:1989 (RA 2009)	0.005% to 15.000%
		P <sub>2</sub> O <sub>5</sub>	IS12423:1989 (RA 2009)	0.005% to 0.500%
		Mn <sub>2</sub> O <sub>3</sub>	IS 12423:1989 (RA 2009)	0.005% to 2.000%
		Cl	IS 4032:1985 (RA 2009)	0.002% to 1.000%

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<b>3.</b>	<b>Gypsum (Mineral &amp; by Product)</b>	Free moisture	IS 10170:1982 (App.)	0.02% to 10%
		Free water	IS 1288:1982 (RA 2010)	0.02% to 10%
		Combined water	IS 1288:1982 (RA 2010)	0.10% to 25.00%
		SiO <sub>2</sub> & Acid Insoluble	IS 1288:1982 (RA 2010)	0.10% to 15.00%
		Iron & Alumina	IS 1288:1982 (RA 2010)	0.10% to 15.0%
		Cl as NaCl	IS 1288:1982 (RA 2010)	0.002% to 0.50%
		CaO	IS 1288:1982 (RA 2010)	0.50% to 32.00%
		MgO	IS 1288:1982 (RA 2010)	0.20% to 8.00%
		SO <sub>3</sub>	IS 1288:1982 (RA 2010)	0.20% to 45.00%
		CaSO <sub>4</sub> .2H <sub>2</sub> O	IS 1288:1982 ((RA 2010)	2.00% to 99.50%
		P <sub>2</sub> O <sub>5</sub>	IS 12423:1988 (RA 2009)	0.005% to 2.00%
		Mn <sub>2</sub> O <sub>3</sub>	IS 12423:1988 (RA 2009)	0.005% to 2.00%
		TiO <sub>2</sub>	IS 12423:1988 (RA 2009)	0.005% to 2.00%
		Sodium Content as (Na)	IS 6046:1982 (App.)	0.005% to 3.00%
Fluorine Content	NCB/F/13:2013	0.002% to 2.00%		

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<b>4.</b>	<b>Iron Ore</b>	Moisture	IS 1493 (Part 1): 1981 (RA 2006)	0.2% to 20.00%
		SiO <sub>2</sub>	IS 1493 (Part 1): 1981 (RA 2006)	0.50% to 10.00%
		Al <sub>2</sub> O <sub>3</sub>	IS 1493 (Part 1): 1981 (RA 2006)	0.2% to 20.00%
		Fe <sub>2</sub> O <sub>3</sub>	IS 1493 (Part 1): 1981 (RA 2006)	0.50% to 95.00%
		CaO	IS 1493 (Part 1): 1981 (RA 2006)	0.20% to 5.00%
		MgO	IS 1493 (Part 1): 1981 (RA 2006)	0.20% to 5.00%
		Na <sub>2</sub> O	IS 1493 (Part 6):1990 (RA 2006) & IS 4032:1985 (RA 2009)	0.05% to 1.00%
		K <sub>2</sub> O	IS 1493 (Part 6):1990 (RA 2006) & IS 4032:1985 (RA 2009)	0.05% to 1.00%
		Cr <sub>2</sub> O <sub>3</sub>	IS 1493 (Part 3): 1987 (RA 2006)	0.05% to 1.00%
		P <sub>2</sub> O <sub>5</sub>	IS 1493 (Part 3): 1987 (RA 2006)	0.05% to 2.00%
		TiO <sub>2</sub>	IS 1493 (Part 3): 1987 (RA 2006)	0.005% to 2.00%
		Mn <sub>2</sub> O <sub>3</sub>	IS 1493 (Part 3): 1987(RA 2006)	0.02% to 5.00%



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<b>III. WATER</b>				
<b>1.</b>	<b>Construction Water</b>	pH	IS:3025 (Part 11):1983 (RA 2006)	4 to 10
		Inorganic Solids	IS:3025 (Part 16):1984 (RA 2006)	(50 to 6000) mg/l
		Suspended matter	IS:3025 (Part 17):1984 (RA 2006)	(30 to 1000) mg/l
		Organic solids	IS:3025 (Part 18):1984 (RA 2006)	(10 to 1000) mg/l
		Acidity/Alkalinity	IS:3025 (Part 23):1986 (RA 2009)	(0.05 to 50) ml
		Sulphate	IS:3025 (Part 24):1986 (RA 2009)	(20 to 2000) mg/l
		Chloride	IS:3025 (Part 32):1988 (RA 2009)	(20 to 5000) mg/l
<b>IV. COAL, COKE &amp; OTHER SOLID FUELS</b>				
<b>1.</b>	<b>Coal and Coke</b>	<b>Proximate analysis</b>		
		Moisture	IS 1350 (Part 1): 1984 (RA 2007)	0.10% to 20.00%
		Ash	IS 1350 (Part 1): 1984 (RA 2007)	0.10% to 60.00%
		Volatile matter	IS 1350 (Part 1): 1984 (RA 2007)	0.20% to 50.00%
		<b>Ultimate Analysis</b>		
		Carbon	IS 1350 (Part 4/Sec 1): 1974 (RA 2010)	0.50% to 85.00%
		Hydrogen	IS 1350 (Part 4/Sec 1): 1974 (RA 2010)	0.50% to 8.00%

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	Coal and Coke	Sulphur	IS 1350 (Part 3):1969 (RA 2010)	0.50% to 15.00%
		Nitrogen	IS 1350 (Part 4/Sec 2):1999 (RA 2010)	0.20% to 3.00%
		Calorific value	IS 1350 (Part 2):1975 (RA 2010)	(200 to 9000) kcal/kg
		Chlorine	IS 1350 (Part 5):1979 (RA 2009)	0.002% to 0.500%

-X-X-X-X-X-X-X-X-X-X-X-X-