Laboratory	**Kailtech Test and Research Centre Private Limited, 141-C, Electronic Complex Industrial Area, Pardesipura, Indore, Madhya Pradesh**				
Accreditation Standard	**ISO/IEC 17025: 2005**				
Discipline	**Chemical Testing**		**Issue Date**	**18.09.2016**	
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Last Amended on	**07.11.2016**		**Page**	**1 of 12**	

S. No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I	**BUILDING MATERIALS**			
1.	**Cement (OPC, PPC, White Cement, PSC, Clinker)**	Silica as SiO_2	IS 4032: 1985 (RA 2014)	15.0 % to 45.0 %
		Iron Oxide as Fe_2O_3		0.1 % to 10.0 %
		Alumina asAl_2O_3		0.1 % to 15.0 %
		Calcium Oxide CaO		30.0 % to 70.0 %
		Magnesia as MgO		0.1 % to 10.0 %
		Sulphuric Anhydride as SO_3		0.1 % to 5.0 %
		Insoluble Residue		0.1 % to 40.0 %
		Loss on Ignition		0.1 % to 10.0 %
		Manganic Oxide as Mn_2O_3		0.05 % to 5.0 %
		Sulphide as Sulphur		0.1 % to 5.0 %
		Moisture Content		0.05 % to 5.0 %
		Chloride Content		0.005 % to 0.50 %
		Sodium Oxide as Na_2O		0.005 % to 5.0 %
		Potassium Oxide as K_2O		0.005 % to 5.0 %
		Titanium Oxide as TiO_2		0.05 % to 2 %
		Phosphorus Oxide as P_2O_5		0.01 % to 3 %

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2.	**Fly Ash**	Silica as SiO_2	IS 1727: 1967 (RA 2013)	20.0 % to 70.0 %
		Alumina as Al_2O_3		5.0 % to 40.0 %
		Iron Oxide as Fe_2O_3		0.5 % to 10.0 %
		Magnesia as MgO		0.1 % to 10.0 %
		Sulphuric Anhydride as SO_3		0.1 % to 5.0 %
		Loss on Ignition		0.1 % to 15.0 %
		Total Chloride	IS 4032: 1985 (RA 2014)	0.005 % to 0.5 %
		Reactive Silica	IS 3812 (Part 1): 2013	20 % to 45 %
		Sodium Oxide (Na_2O)	IS 4032: 1985 (RA 2014)	0.03 % to 5.0 %
		Potassium oxides as K_2O		0.03 % to 5.0 %
		Calcium oxide as CaO	IS 1727: 1967 (RA 2013)	0.05 % to 5.0 %
3.	**Construction chemicals-Admixture**	pH	IS 9103: 1999 (RA 2013)	1 to 13
		Chloride Content		0.005 % to 0.5 %
		Dry Material Content		5.0 % to 80.0 %
		Relative Density		0.8 % to 2.0
		Ash Content		0.05 % to 40 %
4.	**Aggregates**	Alkalies as Na_2O	IS 4032: 1985 (RA 2014)	0.01 % to 0.5 %
		Sulphate as SO_3		0.01 % to 5 %

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	Aggregates	Acid Soluble Chloride content	IS 4032: 1985 (RA 2014)	0.005 % to 1.0 %
		Silica as SiO_2		0.1 % to 70 %
		Sulphur as S		0.005 % to 2 %
		Iron as FeO		0.1 % to 70 %
		Calcium Oxide as CaO		0.1 % to 45 %
		Magnesium Oxide as MgO		0.1 % to 10 %
		Chlorine as NaCl		0.005 % to 0.5 %
		Water Soluble chloride	IS 14959 (Part 2): 2001 (RA 2011)	0.005 % to 0.2 %
5.	**Bitumen Mastic for Flooring**	Calcium Carbonate as $CaCO_3$	IS 1195: 2002 (RA 2014) Annx C	50 % to 99.8 %
6.	**Gypsum**	Free water	IS 1288: 1982 (RA 2010)	0.1 % to 10 %
		Combined water		1 % to 20 %
		Silica as SiO_2		0.1 % to 15 %
		Magnesium Oxide as MgO		0.01 % to 1.5 %
		Calcium Oxide as CaO		5 % to 40 %
		Iron Oxide as Fe_2O_3		0.01 % to 2 %
		Sodium Chloride as NaCl		0.005 % to 5 %
		Alumina as Al_2O_3		0.1 % to 2 %
		SO_3		10 % to 56 %

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II.	**SOLID FUELS**			
1.	**Coal, Coke, Briquettes**	Moisture Content	IS 1350 (Part 1): 1984 (RA 2002)	0.5 % to 30 %
		Ash Content		0.5 % to 60 %
		Volatile Matter		0.1 % to 60 %
		Fixed Carbon		By Calculation
		Gross Calorific Value	IS 1350 (Part 2): 1970 (RA 2000)	1000 kcal/kg to 8500 kcal/kg
		Sulphur	IS 1350 (Part 3): 1969 (RA 2000)	0.05 % to 10 %
III.	**WATER**			
1.	**Construction Water**	pH	IS 3025 (Part 11): 1983 (RA 2002)	1 to 13
		Sulphate as SO_4	IS 3025 (Part 24): 1986 (RA 2003)	5 mg/l to 2000 mg/l
		Chloride	IS 3025 (Part 32): 1988 (RA 2003)	1 mg/l to 2000 mg/l
		Suspended matter	IS 3025 (Part 17): 1984 (RA 2012)	1 mg/l to 3000 mg/l
		Organic matter	IS 3025 (Part 63): 2006	2 mg/l to 1000 mg/l
		Inorganic matter	IS 3025 (Part 16): 1984 (RA 2012)	1 mg/l to 2000 mg/l
		Alkalinity/ To Neutralize with H_2SO_4, 0.02N	IS 3025 (Part 23): 1986 (RA 2003)	0 to 25 ml
		Acidity / To Neutralize with NaOH, 0.02N	IS 3025 (Part 22): 1986 (RA 2003)	0 to 5 ml

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2.	**Ground And Surface Water**	pH	IS 3025 (Part 11): 1983 (RA 2002)	1 to 13
		Sulphate as SO_4	IS 3025 (Part 24): 1986 (RA 2003)	5 mg/l to 2000 mg/l
		Chloride	IS 3025 (Part 32): 1988 (RA 2003)	1 mg/l to 2000 mg/l
		Suspended matter	IS 3025 (Part 17): 1984 (RA 2012)	1 mg/l to 3000 mg/l
		Organic matter	IS 3025 (Part 63): 2007	2 mg/l to 1000 mg/l
		Inorganic matter	IS 3025 (Part 16): 1984 (RA 2012)	1 mg/l to 2000 mg/l
		Salt (NaCl)	IS 3025 (Part 32): 1988 (RA 2003)	1 mg/l to 2000 mg/l
		Alkalinity/ To Neutralize with H_2SO_4, 0.02N	IS 3025 (Part 23): 1986 (RA 2003)	0 to 25 ml
		Acidity / To Neutralize with NaOH, 0.02N	IS 3025 (Part 22): 1986 (RA 2003)	0 to 5 ml
		Total Residue (Total Solid – Dissolved Solids & Suspended)	IS 3025 (Part 15): 1984, Rev. 1	5 mg/l to 10000 mg/l
		Total Hardness	IS 3025 (Part 21): 2009	2 mg/l to 10000 mg/l
		Sulphites as SO_3	IS 3025 (Part 28): 1986 (RA 2009)	5 mg/l to 500 mg/l
		Oil and grease /Mineral Oil	IS 3025 (Part 39): 1991 (RA 2009)	2 mg/l to 1000 mg/l
		Aluminum as Al	IS 3025 (Part 55): 2003 (RA 2009)	5.0 mg/l to 500 mg/l
		Calcium as Ca	IS 3025 (Part 40): 1991 (RA 2009)	0.5 mg/l to 1000 mg/l
		Magnesium as Mg	IS 3025 (Part 46): 1994 (RA 2009)	0.5 mg/l to 1000 mg/l

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	Ground And Surface Water	Copper as Cu	IS 3025 (Part 42): 1992 (RA 2009)	0.02 mg/l to 1000 mg/l
		Free Residual Chlorine	IS 3025 (Part 26): 1991 (RA 2009)	0.001 mg/l to 100 mg/l
		Iron As Fe	IS 3025 (Part 53): 2003 (RA 2009)	0.01 mg/l to 1000 mg/l
		Manganese as Mn	IS 3025 (Part 59): 2006 (RA 2012)	0.001 mg/l to 1000 mg/l
		Selenium as Se	IS 3025 (Part 56): 2003 (RA 2009)	0.005 mg/l to 1000 mg/l
		Zinc as Zn	IS 3025 (Part 49): 1994 (RA 2009)	0.01 mg/l to 1000 mg/l
		Cadmium as Cd	IS 3025 (Part 41): 1992 (RA 2009)	0.001 mg/l to 1000 mg/l
		Lead as Pb	IS 3025 (Part 27): 1986 (RA 2009)	0.1 mg/l to 100 mg/l
		Mercury as Hg	IS 3025 (Part 48): 1994 (RA 2009)	0.001 mg/l to 10.0 mg/l
		Molybdenum as Mo	KTRC/SOP/07 Dated. 25.06.2014	0.001 mg/l to 1000 mg/l
		Nickel as Ni	IS 3025 (Part 53): 2003 (RA 2009)	0.01 mg/l to 1000 mg/l
		Total Arsenic as As	IS 3025 (Part 37): 1986 (RA 2009)	0.001 mg/l to 10.0 mg/l
		Total Chromium as Cr	IS 3025 (Part 52): 2003 (RA 2009)	0.2 mg/l to 1000 mg/l
IV.	**ORES AND MINERALS**			
1.	**Lime Stone & Dolomite**	Loss on ignition	IS 1760 (Part 1): 1991 (RA 2001)	1 % to 50.0 %
		Calcium oxide as CaO	IS 1760 (Part 3): 1992 (RA 2001)	0.5 % to 55 %
		Magnesium Oxide as MgO		0.5 % to 52 %
		Silica as SiO_2	IS 1760 (Part 2): 1991 (RA 2001)	0.5 % to 25 %

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	Lime Stone & Dolomite	Alumina as Al_2O_3	IS 1760 (Part 3): 1992 (RA 2001)	0.1 % to 15 %
		Iron Oxide as Fe_2O_3		0.05 % to 10 %
		Chloride as Cl	IS 1760 (Part 5): 1991 (RA 2001)	0.005 % to 1 %
2.	**Manganese Ore**	Silica as SiO_2	IS 1473: 2004 (RA 2016)	0.25 % to 25 %
		Alumina as Al_2O_3		0.1 % to 25 %
		Iron Oxide as Fe_2O_3		0.05 % to 30 %
		Manganese Dioxide as MnO_2		0.1 % to 80 %
		Manganese Oxide as MnO		0.1 % to 60 %
		Manganese as Mn		5 % to 65 %
		Sulphur as S		0.01 % to 0.5 %
		Phosphorus as P		0.005 % to 1.0 %
3.	**Iron Ores**	Silica as SiO_2	IS 1493 (Part 1): 1981 (RA 2001)	0.1 % to 40 %
		Alumina as Al_2O_3		0.1 % to 10 %
		Total Iron as Fe		5 % to 65 %
		Manganese as Mn	IS 1493: 1959 KTRC/SOP/07 dt 25.06.2014	0.01 % to 5 %
		Phosphorus as P	IS 1493 (Part 1): 1981 (RA 2001)	0.005 % to 1.0%
		Moisture		0.05 % to 10 %
		Titanium Oxide as TiO_2	IS 1493 (Part 3): 1987 (RA 2001)	0.01 % to 8 %

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4.	**Bauxite**	Loss on ignition	IS 2000 (Part 1): 1985 (RA 2001)	1 % to 40 %
		Silica as SiO_2	IS 2000 (Part 2): 1985 (RA 2001)	0.1 % to 10 %
		Alumina as Al_2O_3	IS 2000 (Part 3): 1985 (RA 2001)	5 % to 65 %
		Iron Oxide as Fe_2O_3	IS 2000 (Part 4): 1985(RA 2001)	0.5 % to 25 %
		Titanium Oxide as TiO_2	IS 2000 (Part 5): 1985 (RA 2001)	0.1 % to 12 %
5.	**Silica Sands / Mineral Sands**	Loss on Ignition	IS 1917 (Part 1): 1991 (RA 2006)	0.05 % to 2.0 %
		Sodium and potassium	IS 1917 (Part 2): 1991 (RA 2006)	0.01 % to 1.5 %
		Silica as SiO_2	IS 1917 (Part 3): 1992 (RA 2005)	2.0 % to 95 %
		Aluminum as Al	IS 1917 (Part 4): 1991 (RA 2006)	0.001 % to 5.0 %
		Iron as Fe	IS 1917 (Part 5): 1992 (RA 2005)	0.05 % to 3 %
		Calcium and Magnesium as Ca & Mg	IS 1917 (Part 6): 1992 (RA 2005)	0.05 % to 5 %
		Titania as TiO_2	IS 1917 (Part 7): 2001 (RA 2006)	0.01 % to 2 %
6.	**Salt (Iodized Salt & Common Salt)**	Moisture	IS 7224: 2006 (RA 2016) IS 253: 2014	0.05 % to 10 %
		Water Soluble Matter		0.05 % to 1 %
		Chloride Content as NaCl		80 % to 100 %
		Matter Soluble in water other than Sodium Chloride		0.05 % to 5.0 %
		Calcium as Ca		0.01 % to 0.5 %

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	Salt (Iodized Salt & Common Salt)	Magnesium as Mg	IS 7224: 2006 (RA 2016) IS 253: 2014	0.01 % to 0.5 %
		Sulphate as SO_4		0.01 % to 1.0 %
		Alkalinity as Na_2CO_3		0.01 % to 0.5 %
		Arsenic as As		0.0001 mg/g to 1.0 mg/g
		Iron as Fe		0.001 mg/g to 100 mg/g
		Iodine content	IS 7224: 2006 (RA 2016)	0.002 mg/g to 10mg/g
V.	**METALS AND ALLOYS**			
1.	**Carbon Steel, Stainless Steel, Special Steel, Low/High Alloy Steel**	Carbon as C	IS 228 (Part 1): 1987 (RA 2008)	0.05 % to 2.5 %
		Sulphur as S	IS 228 (Part 9): 1989	0.01 % to 0.25 %
		Phosphorus as P	IS 228 (Part 3): 1987 (RA 2008)	0.005 % to 0.5 %
		Manganese as Mn	IS 228 (Part 2): 1987 (RA 2008) IS 228 (Part 12): 2001 (RA 2009)	0.1 % to 1.5 % 0.01 % to 5.0 %
		Silicon as Si	IS 228 (Part 8): 1989 (RA 2009)	0.05 % to 5.0 %
		Nitrogen as N	IS 228 (Part 19): 1998	0.002 % to 0.5 %
		Molybdenum as Mo	IS 228 (Part 7): 1990 (RA 2006) IS 228 (Part 10): 1989 (RA 2009)	1.0 % to 5.0 % 0.01 % to 1.5 %
		Nickel as Ni	IS 228 (Part 5): 1987 (RA 2009)	0.1 % to 10 %
		Copper as Cu	IS 228 (Part 21): 2003 (RA 2008) IS 228 (Part 15): 1992 (RA 2009)	0.02 % to 0.5 % 0.05 % to 5.0 %

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	Carbon Steel, Stainless Steel, Special Steel, Low/High Alloy Steel	Chromium as Cr	IS 228 (Part 5): 1987 (RA 2009)	0.1 % to 20 %
		Aluminum as Al	KTRC/SOP/07 dt 25.06.2014	0.01 % to 1.5 %
		Chromium as Cr		0.01 % to 26 %
		Copper as Cu		0.01 % to 3.0 %
		Manganese as Mn		0.005 % to 12 %
		Molybdenum as Mo		0.001 % to 4.0 %
		Nickel as Ni		0.001 % to 25 %
		Titanium as Ti		0.005 % to 1.0 %
		Vanadium as V		0.005 % to 4.0 %
		Phosphorus as P		0.002 % to 0.25 %
		Boron as B		0.0005 % to 0.5 %
2.	**Aluminum And Its Alloys**	Silicon as Si	KTRC/SOP/07 dt 25.06.2014	0.001 % to 2 %
		Copper as Cu		0.002 % to 8.0 %
		Iron as Fe		0.005 % to 5.0 %
		Magnesium as Mg		0.001 % to 10.0 %
		Zinc as Zn		0.005 % to 8.0 %
		Manganese as Mn		0.005 % to 5.0 %

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	Aluminum And Its Alloys	Chromium as Cr	KTRC/SOP/07 dt 25.06.2014	0.005 % to 1.0 %
		Nickel as Ni		0.01 % to 5.0 %
		Titanium as Ti		0.001 % to 1.0 %
		Lead as Pb		0.001 % to 0.5 %
3.	**Zinc and its alloys**	Iron as Fe	KTRC/SOP/07 dt 25.06.2014	0.01 % to 10.0 %
		Copper as Cu		0.001 % to 45 %
		Nickel as Ni		0.001 % to 1.0 %
		Lead as Pb		0.001 % to 10.0 %
		Aluminum as Al		0.01 % to 5.0 %
		Cadmium as Cd		0.005 % to 0.5 %
4.	**Copper and its Alloys**	Zinc as Zn	KTRC/SOP/07 dt 25.06.2014	0.001 % to 40 %
		Lead as Pb		0.001 % to 10 %
		Nickel as Ni		0.01 % to 5 %
		Iron as Fe		0.01 % to 5 %
		Aluminum as Al		0.01 % to 25 %
		Arsenic as As		0.01 % to 0.5 %
		Silicon as Si		0.001 % to 2 %
		Cadmium as Cd		0.005 % to 1 %

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VI.	**METALLIC COATING & TREATMENT SOLUTIONS**			
1.	**Metallic Coating of sheets, wires and zinc coated articles**	Mass of Zinc Coating	IS 6745: 1972 (RA 2011)	20 g/m^2 to 1500 g/m^2
		Uniformity of Zinc Coating	IS 4826: 1979 (RA 2011) IS 2633: 1986 (RA 2011)	Qualitative
VII.	**SOIL AND ROCK**			
1.	**Clays and Soils**	pH	IS 2720 (Part 26): 1987 (RA 2011)	1 to 13
		Sulphate as SO_4	IS 2720 (Part 27): 1977 (RA 2010)	0.005 % to 5 %
		Chloride as Cl		0.005 % to 5 %
		Calcium Carbonate as $CaCO_3$	IS 2720 (Part 23): 1976 (RA 2010)	0.05 % to 80 %
		Nitrogen as N	IS 14684: 1999 (RA 2008)	0.002 % to 10 %
		Organic Matter	IS 2720 (Part 22): 1972 (RA 2010)	0.05 % to 2.5 %
		Silica as SiO_2	IS 2720 (Part 25): 1982 (RA 2010)	0.1 % to 50 %

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