Laboratory	**Kailtech Test and Research Centre Private Limited, 141-C, Electronic Complex Industrial Area, Pardesipura, Indore, Madhya Pradesh**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-7832** ***(in lieu of T-1800, T-1801, T-3484 & T-4240)***	**Page 1 of 46**	
Validity	**11.09.2018 to 10.09.2020**	**Last Amended on --**	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection

CHEMICAL TESTING

I.	**BUILDING MATERIALS**			
1.	**Cement (OPC, PPC, White Cement, PSC, Clinker)**	Silica (SiO_2)	IS 4032	15.0 % to 45.0 %
		Iron Oxide (Fe_2O_3)		0.1 % to 10.0 %
		Alumina (Al_2O_3)		0.1 % to 15.0 %
		Calcium Oxide (CaO)		30.0 % to 70 %
		Magnesia (MgO)		0.1 % to 10.0 %
		Sulphuric Anhydride (SO_3)		0.1 % to 5.0 %
		Insoluble Residue		0.1 % to 40.0 %
		Loss on Ignition		0.1 % to 10.0 %
		Manganic Oxide (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 (Na_2O)		0.005 % to 5.0 %
		Potassium Oxide (K_2O)		0.005 % to 5.0 %
		Titanium Oxide (TiO_2)		0.05 % to 2 %
		Phosphorus Oxide (P_2O_5)		0.01 % to 3 %
2.	**Fly Ash**	Silica (SiO_2)	IS 1727	20.0 % to 70.0 %
		Alumina (Al_2O_3)		5.0 % to 40.0 %
		Iron Oxide (Fe_2O_3)		0.5 % to 10.0 %
		Magnesia (MgO)		0.1 % to 10.0 %
		Sulphuric Anhydride (SO_3)		0.1 % to 5.0 %
		Loss on Ignition		0.1 % to 15.0 %
		Total Chloride	IS 4032	0.005 % to 0.5 %
		Reactive Silica	IS 3812 (Part 1)	20 % to 45 %
		Sodium Oxide (Na_2O)	IS 4032	0.03 % to 5.0 %
		Potassium Oxide (K_2O)	IS 4032	0.03 % to 5.0%
		Calcium oxide (CaO)	IS 1727	0.05 % to 5.0 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
3.	**Bitumen & Bituminous Material**	Flash Point	IS 1448 (Part 69)	30 °C to 355 °C
		Solubility in Trichloroethylene	IS 1216	0.5 % to 100 %
		Kinematic Viscosity	IS 1206 (Part 3)	2 cSt to 800 cSt
		Mineral Matter (Ash Content)	IS 1217	0.01 % to 10 %
		Loss on Heating	IS 1212	0.01% to 10 %
		Water Content	IS 1211	0.01 % to 10 %
		Specific Gravity	IS 1202	0.7 to 2.0
		Volatile matter Content	IS 1220	0.1% to 75 %
		Matter Soluble in toluene	IS 1215	0.1% to 30 %
4.	**Bitumen Emulsion**	Residue on 600 Micron Sieve	IS 8887	0.01% to 1.0 %
		Viscosity by Saybolt Furol Viscometer	IS 3117	1 Saybolt to 500 Saybolt
		Coagulation	IS 8887	Qualitative
		Storage Stability		0.1 % to 10 %
		Miscibility with water		Qualitative
		Residue by Evaporation		0.05 % to 90 %
		Water Content		0.05 % to 25 %
		Particle Charge (Cationic/Anionic)		Qualitative
5.	**Construction Chemicals-Admixture**	pH	IS 9103	2 to 12
		Chloride Content		0.005 % to 0.5 %
		Dry Material Content		5.0 % to 80.0 %
		Relative Density		0.8 to 2.0
		Ash Content		2 % to 40 %
6.	**Coarse And Fine Aggregate**	Alkali Reactivity (Chemical Method)	IS 2386 (Part 7)	20 millimoles/l to 2500 millimoles/l
		Organic Matter	IS 2720 (Part 22)	0.05 % to 2.5 %
		Coal and Lignite	IS2386 (Part 2)	0.05 % to 5 %
		Clay lumps	IS 2386 (Part 2)	0.05 % to 5 %
		Material finer than 75	IS 2386 (Part 1)	0.05 % to 25 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		micron		
		Soft Fragment	IS 2386 (Part 2)	0.05 % to 3 %
		Shale	IS 2386 (Part 2)	0.05 % to 2 %
		Mica	IS 2386 (Part 2)	0.05 % to 2 %
		Soundness by Magnesium Sulphate $MgSO_4$	IS 2386 (Part 5)	0.02 % to 20 %
		Soundness by Sodium Sulphate Na_2SO_4	IS 2386 (Part 5)	0.02 % to 15 %
		Iron Unsoundness	IS 383	0.1 % to 5 %
		Sand Equivalent Value	IS 2720 (Part 37)	25 % to 80 %
		Stripping Value of Aggregate	IS 6241	90 % to 100 %
7.	**Manufactured Coarse & Fine Aggregate**	Alkalies (Na_2O)	IS 4032	0.01 % to 0.5 %
		Sulphate (SO_3)		0.01 % to 5 %
		Acid Soluble Chloride content		0.005 % to 1.0 %
		Silica (SiO_2)		0.1 % to 70 %
		Sulphur (S)		0.005 % to 2 %
		Iron (FeO)		0.1 % to 70 %
		Calcium Oxide (CaO)		0.1 % to 45 %
		Magnesium Oxide (MgO)		0.1 % to 10 %
		Chlorine (NaCl)		0.005 % to 0.5 %
		Water Soluble chloride	IS 14959 (Part 2)	0.005 % to 0.2 %
8.	**Bitumen Mastic for Flooring**	Calcium Carbonate ($CaCO_3$)	IS 1195 (Annexure C)	50 % to 99.8 %
9.	**Building Lime**	Calcium and Magnesium	IS 6932 (Part 1)	25 % to 90 %
		Magnesium Oxide		0.5 % to 10 %
		Silica, Alumina and Ferric Oxide		0.5 % to 25 %
		Unhydrated Magnesium		0.5 % to 8 %
		Insoluble Residue in dilute acid and alkalis	IS 6932 (Part 1)	0.5 % to 25 %
		Carbon dioxide	IS 6932 (Part 2)	0.2 % to 5 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Free moisture	IS 1514	0.1 % to 2.5 %
		Available lime (CaO)	IS 1514	5 % to 80 %
II.	**SOLID FUELS**			
1.	**Coal, Coke & Lignite**	Moisture Content	IS 1350(Part 1)	0.5 % to 30 %
		Ash Content		0.5 % to 60 %
		Volatile Matter		2 % to 60 %
		Fixed Carbon		By Calculation
		Gross Calorific Value	IS1350 (Part 2)	1000 kcal/kg to 8500 kcal/kg
		Sulphur	IS 1350 (Part 3)	0.05 % to 10 %
		Specific Gravity	KTRC/CHEM/SOP/22 Issue No. 1 Dated 18.06.2018	1.2 to 3.5
2.	**Briquettes**	Gross Calorific Value	KTRC/CHEM/SOP/23 Issue No. 1 Dated 16.06.2018	1000 kcal/kg to 8500 kcal/kg
III.	**WATER**			
1.	**Construction Water**	pH	IS 3025(Part 11)	1 to 13
		Sulphate as SO_4	IS 3025 (Part 24)	5 mg/l to 2000 mg/l
		Chloride	IS 3025 (Part 32)	5 mg/l to 2000 mg/l
		Suspended matter	IS 3025 (Part 17)	5 mg/l to 3000 mg/l
		Organic matter	IS 3025 (Part 18)	4 mg/l to 1000 mg/l
		Inorganic matter/Filterable Residue/Total Dissolved solids	IS 3025(Part 16)	1 mg/l to 2000 mg/l
		Acidity as NaOH	IS 3025 (Part 22)	0.2 ml to 5 ml
		Alkalinity as H_2SO_4	IS 3025 (Part 23)	0.2 ml to 25 ml
2.	**Ground And**	pH	IS 3025 (Part 11)	1 to 13

Laboratory	**Kailtech Test and Research Centre Private Limited, 141-C, Electronic Complex Industrial Area, Pardesipura, Indore, Madhya Pradesh**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-7832** ***(in lieu of T-1800, T-1801, T-3484 & T-4240)***	**Page 5 of 46**	
Validity	**11.09.2018 to 10.09.2020**	**Last Amended on --**	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	Surface Water	Sulphate as SO_4	IS 3025 (Part 24)	5 mg/l to 2000 mg/l
		Chloride	IS 3025 (Part 32)	5 mg/l to 2000 mg/l
		Suspended matter	IS 3025 (Part 17)	5 mg/l to 3000 mg/l
		Organic matter	IS 3025 (Part 18)	5 mg/l to 1000 mg/l
		Inorganic matter/ Filterable Residue/ Total Dissolved solids	IS 3025 (Part 16)	5 mg/l to 2000 mg/l
		Salts	IS 3025 (Part 32)	5 mg/l to 2000 mg/l
		Acidity as NaOH	IS 3025 (Part 22)	0.2 ml to 5 ml
		Alkalinity as H_2SO_4	IS 3025 (Part 23)	0.2 ml to 2 5 ml
		Total Residue (Total Solid-Dissolved Solids & Suspended)	IS 3025 (Part 15)	5 mg/l to 10000 mg/l
		Total Hardness	IS 3025 (Part 21)	2 mg/l to 10000 mg/l
		Sulphites as SO_3	IS 3025 (Part 28)	5 mg/l to 500 mg/l
		Oil and grease/Mineral Oil	IS 3025 (Part 39)	2 mg/l to 1000 mg/l
		Aluminum as Al	IS 3025 (Part 55)	5.0 mg/l to 500 mg/l
		Calcium as Ca	IS 3025 (Part 40)	0.5 mg/l to 1000 mg/l
		Magnesium as Mg	IS 3025 (Part 46)	0.5 mg/l to 1000 mg/l
		Copper as Cu	IS 3025 (Part 42)	0.02 mg/l to 1000 mg/l
		Free Residual Chlorine	IS 3025 (Part 26)	0.01 mg/l to 100 mg/l
		Iron as Fe	IS 3025 (Part 53)	0.1 mg/l to 1000 mg/l
		Manganese as Mn	IS 3025 (Part 59)	0.01 mg/l to 1000 mg/l
		Selenium as Se	IS 3025 (Part 56)	0.05 mg/l to 1000 mg/l
		Zinc as Zn	IS 3025 (Part 49)	0.01 mg/l to 1000 mg/l
		Cadmium as Cd	IS 3025 (Part 41)	0.02 mg/l to 1000 mg/l
		Lead as Pb	IS 3025 (Part 27)	0.1 mg/l to 100 mg/l
		Mercury as Hg	IS 3025 (Part 48)	0.05 mg/l to 10.0 mg/l
		Molybdenum as Mo	KTRC/SOP/07 Issue No. 1 Dated: 25.06.2014 (By AAS)	0.02 mg/l to 1000 mg/l
		Nickel as Ni	IS 3025 (Part 54)	0.02 mg/l to 1000 mg/l

Prince Garg
Convenor

Birendra Prasad Murmu
Program Manager

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Total Arsenic as As	IS 3025 (Part 37)	0.02 mg/l to 10 mg/l
		Total chromium as Cr	IS 3025 (Part 52)	0.2 mg/l to 1000 mg/l
		Sodium as Na	IS 3025 (Part 45)	10 mg/l to 500 mg/l
		Potassium as K	IS 3025 (Part 45)	10 mg/l to 500 mg/l
IV.	**ORES AND MINERALS**			
1.	**Lime Stone, Dolomite & Allied Material**	Loss on ignition	IS 1760 (Part 1)	1 % to 50.0%
		Calcium oxide as CaO	IS 1760 (Part 3)	0.5 % to 55 %
		Magnesium Oxide as MgO	IS 1760 (Part 3)	0.5 % to 52 %
		Silica as SiO_2	IS 1760 (Part 2)	0.5 % to 25 %
		Alumina as Al_2O_3	IS 1760 (Part 3)	0.1 % to 15 %
		Iron Oxide as Fe_2O_3	IS 1760 (Part 3)	0.05 % to 10%
		Chloride as Cl	IS 1760 (Part 5)	0.005 % to 1 %
		Specific Gravity	KTRC/CHEM/SOP/22 Issue No. 1 Dated 18.06.2018	1.2 to 3.5
2.	**Manganese Ore**	Silica as SiO_2	IS 1473	0.25% to 25 %
		Alumina as Al_2O_3		0.1 % to 25 %
		Total Iron		0.05 % to 30 %
		Manganese Dioxide as MnO_2		0.1 % to 80 %
		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)	0.1 % to 40 %
		Alumina as Al_2O_3		0.1 % to 10 %
		Total Iron as Fe		5 % to 65 %
		Manganese as MnO	IS 1493	0.01 % to 5 %
		Phosphorus as P_2O_5	IS 1493 (Part 1)	0.005 % to 1.0 %
		Moisture		0.05 % to 10 %
		Titanium Oxide as TiO_2		0.01 % to 8 %
4.	**Bauxite**	Loss on ignition	IS 2000 (Part 1)	1% to 40 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Silica as SiO_2	IS 2000(Part 2)	0.1% to 10 %
		Alumina as Al_2O_3	IS 2000 (Part 3)	5 % to 65 %
		Iron Oxide as Fe_2O_3	IS 2000(Part 4)	0.5 % to 25 %
		Titanium Oxide as TiO_2	IS 2000 (Part 5)	0.1 % to 12 %
		Calcium as Ca	IS 2000(Part 9)	0.03 % to 0.40 %
		Magnesium as Mg	IS 2000 (Part 9)	0.03 % to 0.20 %
		Specific Gravity	KTRC/CHEM/SOP/22 Issue No. 1 Dated 18.06.2018	1.2 to 3.5
5.	**Gypsum**	Free water	IS 1288	0.1 % to 10 %
		Combined water		1 % to 20 %
		Silica as SiO_2 & Acid Insoluble		0.1 % to 15 %
		Magnesium as MgO		0.01 % to 1.5 %
		Calcium as CaO		5 % to 40 %
		Iron and Aluminium Oxide		0.01% to 2 %
		Sodium Chloride as NaCl		0.005 % to 5 %
		Sulphur as Trioxide		10 % to 56 %
6.	**Silica Sands/ Mineral Sands**	Loss on Ignition	IS 1917 (Part 1)	0.05 % to 2.0 %
		Sodium and Potassium	IS 1917 (Part 2)	0.01 % to 1.5 %
		Silica as SiO_2	IS 1917 (Part 3)	2.0 % to 95 %
		Aluminum as Al	IS 1917 (Part 4)	0.2 % to 4.0 %
		Iron as Fe	IS 1917 (Part 5)	0.05 % to 0.5 %
		Specific Gravity	KTRC/CHEM/SOP/22 Issue No. 1 Dated 18.06.2018	1.2 to 3.5
		Calcium and Magnesium as Ca & Mg	IS 1917 (Part 6)	0.05 % to 0.5 %
		Titania as TiO_2	IS 1917 (Part 7)	0.02 % to 2 %
V.	**INDUSTRIAL & FINE CHEMICALS**			

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
1.	**Salt (Iodized Salt & Common Salt)**	Moisture	IS 7224 IS 253	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	IS 7224 IS 253	0.01 % to 0.5 %
		Magnesium as Mg		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/kg to 1.0 mg/kg
		Iron as Fe		0.001 mg/kg to 100 mg/kg
		Iodine Content	IS 7224	0.002 mg/kg to 10 mg/kg
		Lead as Pb	IS 7224 IS 253	0.002 mg/l to 1.0 mg/l
		Copper as Cu	IS 253	0.002 mg/l to 1.0 mg/l
VI.	**SOIL AND ROCK**			
1.	**Clays and Soils**	pH	IS 2720 (Part 26)	2 to 12
		Sulphate as SO_4	IS 2720 (Part 27)	0.005 % to 5 %
		Chloride as Cl	IS 2720 (Part 27)	0.005 % to 5 %
		Calcium Carbonate as $CaCO_3$	IS 2720 (Part 23)	0.05 % to 80 %
		Nitrogen as N	IS 14684	0.002 % to 10 %
		Organic Matter	IS 2720 (Part 22)	0.05 % to 2.5 %
		Silica as SiO_2	IS 2720 (Part 25)	0.1 % to 50 %
VII.	**METALS AND ALLOYS**			

Laboratory	**Kailtech Test and Research Centre Private Limited, 141-C, Electronic Complex Industrial Area, Pardesipura, Indore, Madhya Pradesh**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-7832** ***(in lieu of T-1800, T-1801, T-3484 & T-4240)***	**Page 9 of 46**	
Validity	**11.09.2018 to 10.09.2020**	**Last Amended on --**	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
1.	**Low Alloys Steel**	Carbon	IS 228 (Part 1)	0.05 % to 2.5 %
		Sulphur	IS 228 (Part 9)	0.01 % to 0.25 %
		Phosphorus	IS 228 (Part 3)	0.005 % to 0.5 %
		Manganese	IS 228 (Part 2) IS 228 (Part 12)	0.1 % to 1.5 % 0.01 % to 5.0 %
		Silicon	IS 228 (Part 8)	0.05 % to 5.0 %
		Nitrogen	IS 228 (Part 19)	0.005 % to 0.5 %
		Molybdenum	IS 228 (Part 7) IS 228 (Part 10)	1.0 % to 5.0 % 0.01 % to 1.5 %
		Nickel	IS 228 (Part 5)	0.1 % to 6 %
		Copper	IS 228 (Part 21) IS 228 (Part 15)	0.02 % to 0.5 % 0.05 % to 5.0 %
		Chromium	IS 228 (Part 6)	0.1 % to 20 %
2.	**Stainless Steel**	Aluminum	KTRC/SOP/07 Issue No. 1 Dated: 25.06.2014 (By AAS)	0.01 % to 0.5 %
		Chromium		0.5 % to 26 %
		Copper		0.01 % to 3.0 %
		Manganese		0.01 % to 12 %
		Molybdenum		0.01 % to 4.0 %
		Nickel		0.01 % to 25 %
		Titanium		0.05 % to 1.0 %
		Vanadium		0.05 % to 1.0 %
		Phosphorus		0.02 % to 0.25 %
		Boron		0.0005 % to 0.5 %
		Niobium		0.01 % to 0.5 %
		Cobalt		0.01 % to 0.5 %
		Calcium		0.02 % to 0.5 %
		Tin		0.01% to 0.5 %
3.	**Aluminum And Its Alloys**	Silicon	KTRC/SOP/07 Issue No. 1 Dated 25.06.2014 (By AAS)	0.01 % to 2 %
		Copper		0.04 % to 8.0 %
		Iron		0.05 % to 5.0 %
		Magnesium		0.01 % to 10.0 %
		Zinc		0.05 % to 8.0 %

Prince Garg
Convenor

Birendra Prasad Murmu
Program Manager

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Manganese		0.05 % to 5.0 %
		Chromium		0.05 % to 1.0 %
		Nickel		0.01 % to 5.0 %
		Titanium		0.01 % to 1.0 %
		Lead		0.001 % to 0.5 %
4.	**Zinc and its alloys**	Iron	KTRC/SOP/07 Issue No. 1 Dated 25.06.2014 (By AAS)	0.01 % to 10.0 %
		Copper		0.01 % to 45 %
		Nickel		0.01 % to 1.0 %
		Lead		0.01 % to 10.0 %
		Aluminum		0.01 % to 5.0 %
		Cadmium		0.05 % to 0.5 %
5.	**Copper and its Alloys**	Zinc	KTRC/SOP/07 Issue No. 1 Dated 25.06.2014 (By AAS)	0.01% to 40 %
		Lead		0.01 % to 10 %
		Nickel		0.01 % to 5 %
		Iron		0.01 % to 5 %
		Aluminum		0.01 % to 25 %
		Arsenic		0.01 % to 0.5 %
		Silicon		0.001 % to 2 %
		Cadmium		0.05 % to 1%
		Tin		0.1 % to 20 %
6.	**Stainless Steel (By OES)**	Carbon	IS 9879	0.01 % to 2.6 %
		Sulphur	ASTM E1086 IS 9879	0.01 % to 0.42 %
		Phosphorus		0.01 % to 0.1 %
		Manganese		0.02 % to 18.0 %
		Silicon		0.015 % to 4.5 %
		Chromium		0.05 % to 30.0 %
		Nickel		0.05 % to 50.0%
		Molybdenum		0.05 % to 5.5 %
		Titanium	KTRC/CHEM/SOP/21 Issue No. 1 Dated 16.06.2018	0.02 % to 2.3 %
		Niobium		0.02 % to 3.0 %
		Vanadium		0.02 % to 1.0 %
		Copper	ASTM E1086, IS 9879	0.02 % to 4.0 %
		Aluminum	KTRC/CHEM/SOP/21	0.01 % to 0.4 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			Issue No. 1 Dated 16.06.2018	
7.	**Carbon Steel & Low Alloy Steel (By OES)**	Carbon	ASTM E415 IS 8811	0.01 % to 1.8 %
		Sulphur		0.01 % to 0.35 %
		Phosphorus		0.01 % to 0.15 %
		Manganese		0.02 % to 2.5 %
		Silicon		0.03 % to 2.3 %
		Chromium		0.01 % to 5.5 %
		Nickel		0.01 % to 5.5 %
		Molybdenum		0.01 % to 1.5 %
		Titanium		0.01 % to 0.5%
		Niobium		0.01 % to 1.0 %
		Vanadium		0.01 % to 1.0 %
		Copper		0.01 % to 0.8 %
		Aluminum		0.01 % to 1.5%
		Tin		0.02 % to 0.2 %
		Boron		0.0005 % to 0.025 %
		Calcium	KTRC/CHEM/SOP/21 Issue No. 1 Dated 16.06.2018	0.005 % to 0.0075 %
8.	**Tool Steel (By OES)**	Carbon	KTRC/CHEM/SOP/21 Issue No. 1 Dated 16.06.2018	0.03 % to 2.6 %
		Sulphur		0.01 % to 0.1 %
		Phosphorus		0.01 % to 0.06%
		Manganese		0.05 % to 2.4 %
		Silicon		0.02 % to 1.50 %
		Chromium		0.05 % to 20.0 %
		Nickel		0.05 % to 5.0 %
		Molybdenum		0.05 % to 11.0%
		Titanium		0.02 % to 1.0 %
		Copper		0.02 % to 1.0 %
		Cobalt		0.05 % to 13.0 %
		Vanadium		0.02 % to 11.0 %
		Tungsten		0.02 % to 22.0 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
9.	**Cast Iron (By OES)**	Carbon	ASTM E 1999	1.7 % to 4.5 %
		Sulphur		0.02 % to 0.15 %
		Phosphorus		0.02 % to 0.80 %
		Manganese		0.05 % to 0.6 %
		Silicon		0.025 % to 3.6 %
		Chromium	ASTM E 1999	0.05 % to 1.3 %
		Nickel		0.05 % to 1.8 %
		Titanium		0.01 % to 0.3 %
		Copper		0.02 % to 1.6%
		Aluminum	KTRC/SOP/08 A	0.01 % to 0.12 %
10.	**Copper and Its Alloys (By OES)**	Tin	KTRC/CHEM/SOP/21 Issue No. 1 Dated 16.06.2018	0.02 % to 20.0 %
		Zinc		0.01 % to 50.0 %
		Lead		0.02 % to 25.0 %
		Iron		0.02 % to 7.5 %
		Nickel		0.02 % to 42.0 %
		Aluminum		0.01 % to 13.0 %
		Manganese		0.01 % to 15.0%
		Sulphur		0.01 % to 0.2 %
		Silver		0.02 % to 1.7 %
		Cadmium		0.02 % to 1.3 %
		Silicon		0.03 % to 8.5 %
		Chromium		0.01 % to 3.5 %
		Phosphorus		0.02 % to 1.0 %
11.	**Aluminum and Its Alloys (By OES)**	Copper	ASTM E 1251 ASTM E 227	0.01 % to 11.0 %
		Tin	ASTM E 1251	0.05 % to 4.5 %
		Zinc		0.02 % to 13.5 %
		Lead		0.05 % to 1.8 %
		Iron		0.01 % to 3.0 %
		Nickel		0.03 % to 6.0 %
		Manganese		0.02 % to 2.2 %
		Titanium		0.01 % to 0.70 %
		Chromium		0.01 % to 0.70 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Silicon		0.02 % to 28.0 %
		Magnesium		0.01 % to 13.0%
		Cadmium	KTRC/CHEM/SOP/21 Issue No. 1 Dated 16.06.2018	0.01 % to 0.4 %
		Calcium		0.01% to 0.02 %
12.	**PMI-Ferrous Base (By Portland Oxford OES)**	Chromium	ASTM E1476	Qualitative
		Nickel		
		Molybdenum		
		Copper		
		Carbon		
		Silicon		
		Sulphur		
		Phosphorous		
		Chromium		
		Manganese		
VIII.	**HAZARDOUS & RESTRICTED CHEMICALS**			
1.	**Safety of Electric Toy**	Antimony as Sb	KTRC/SOP/07 Issue No. 1 Dated 25.06.2014 (By AAS)/ Spectrophotometer	1 mg/kg to 200 mg/kg
		Arsenic as As	KTRC/SOP/07 Issue No. 1 Dated 25.06.2014 (By AAS)/ Spectrophotometer	10 mg/kg to 100 mg/kg
		Barium as Ba	KTRC/SOP/07 Issue No. 1 Dated 25.06.2014 (By AAS)	10 mg/kg to 1500 mg/kg
		Cadmium as Cd		10 mg/kg to 200 mg/kg
		Chromium as Cr		10 mg/kg to 100 mg/kg
		Lead as Pb		10 mg/kg to 200 mg/kg
		Mercury as Hg		10 mg/kg to 100 mg/kg
		Selenium as Se		10 mg/kg to 800 mg/kg

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
IX.	**METALLIC COATING & TREATMENT SOLUTIONS**			
1.	**Metallic Coating of sheets, wires and zinc coated articles**	Mass of Zinc Coating	IS 6745	20 g/m^2 to1500 g/m^2
		Uniformity of Zinc Coating	IS 4826 IS 2633	Qualitative
		Anodic Coating	IS 5523	5 µm to 150 µm
X.	**CORROSION TESTS**			
1.	**Metal**	Corrosion Resistance	IS 10461 (Part 1)	0.05 mm to 0.6 mm
			IS 10461 (Part 2)	Qualitative
		Salt Spray Test	IS 9844	Qualitative
		Salt Mist Test	IS 9000 (Part 11) IS 9844	Qualitative
		Fine Mist Test	IS 9000 (Part 22)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			ELECTRICAL TESTING	
I.	**DOMESTIC ELECTRICAL APPLIANCES**			
1.	**Safety of Household and Similar Electrical Appliances (Microwave Oven, Including Combination Microwave Oven, Clocks)**	Marking and Instructions	IS 302-1+A1+A2+A3+A4 (Clause 7) IS 302-2-25 (Clause 7) IS 302-2-26 (Clause 7)	Qualitative
		Protection against access to live parts	IS 302-1+A1+A2+A3+A4 (Clause 8) IS 302-2-25 (Clause 8) IS 302-2-26 (Clause 8)	Qualitative (0.1 N to 500 N)
		Power Input And Current	IS 302-1+A1+A2+A3+A4 (Clause 10) IS 302-2-25 (Clause 10) IS 302-2-26 (Clause 10)	Current-0.1 A to 30 A, AC Voltage:1 V to 300 V Power-1 W to 5000 W
		Heating	IS 302-1+A1+A2+A3+A4 (Clause 11) IS 302-2-25 (Clause 11) IS 302-2-26 (Clause 11)	Temperature :Ambient to 400 ˚C
		Leakage current and electric strength at operating temperature	IS 302-1+A1+A2+A3+A4 (Clause 13) IS 302-2-25 (Clause 13) IS 302-2-26 (Clause 13)	0.1 mA to 3.5 mA Qualitative AC Voltage: Upto 10 kV
		Transient Over Voltage	IS 302-1+A1+A2+A3+A4 (Clause 14) IS 302-2-25 (Clause 14) IS 302-2-26 (Clause 14)	Qualitative 0.01 kV to 10 kV Imp-1.2/50µs
		Moisture resistance	IS 302-1+A1+A2+A3+A4 (Clause15) IS 302-2-25 (Clause15) IS 302-2-26 (Clause 15)	Qualitative Temperature: Ambient to 40°C Relative Humidity: 40 % to 96 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Leakage current and electric strength	IS 302-1+A1+A2+A3+A4 (Clause 16) IS 302-2-25 (Clause 16) IS 302-2-26 (Clause 16)	0.1mA to 3.5 mA Qualitative AC Voltage: 0.01 kV to 10kV
		Endurance	IS 302-2-25 (Clause 18)	Qualitative
		Stability and Mechanical Hazards	IS 302-1+A1+A2+A3+A4 (Clause 20) IS 302-2-25 (Clause 20) IS 302-2-26 (Clause 20)	Qualitative
		Mechanical Strength	IS 302 1+A1+A2+A3+A4 (Clause 21) IS 302-2-25 (Clause 21) IS 302-2-26 (Clause 21)	Qualitative
		Provision for earthing	IS 302-1+A1+A2+A3+A4 (Clause 27) IS 302-2-25 (Clause 27) IS 302-2-26 (Clause 27)	AC Voltage: 0.01 V to 9.99 V Current:0.01 A to 50 A
		Clearances Creepage distances and solid insulation	IS 302-1+A1+A2+A3+A4 (Clause 29) IS 302-2-25 (Clause 29) IS 302-2-26 (Clause 29)	0.01 mm to 300 mm
		Resistance to Heat & Fire	IS 302-1+A1+A2+A3+A4 (Clause 30) IS 302-2-25 (Clause 30) IS 302-2-26 (Clause 30)	Qualitative
		Radiation, Toxicity and similar hazards	IS 302-2-25 (Clause 32)	Qualitative 9.99 mW/cm^2

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
II.	**LAMPS, LUMINARIES & ACCESSORIES**			
1.	**Luminaries (Fixed General Purpose Luminaries) (Recessed Luminaries) (Floodlights) (Road and Street Light)**	Verification of Marking	IS 10322 (Part 1,Section 3) IS10322 (Part 5,Section 1, Clause 6) IS10322 (Part 5, Section 2, Clause 6) IS10322 (Part 5, Section 3, Clause 6) IS10322 (Part 5, Section 5, Clause 6)	Qualitative
		Creepage Distances and Clearances	IS 10322 (Part 1, Section 11) IS10322 (Part 5, Section 1, Clause 8) IS10322 (Part 5, Section 2, Clause 8) IS10322 (Part 5, Section 3, Clause 8) IS10322 (Part 5, Section 5, Clause 8)	0.01 mm to 300 mm
		Provision for Earthing	IS 10322 (Part 1, Section 7) IS10322 (Part 5, Section 1, Clause 9) IS10322 (Part 5, Section 2, Clause 9) IS10322 (Part 5, Section 3, Clause 9) IS10322 (Part 5, Section 5, Clause 9)	0.01 Vac to 9.99 Vac 0.1 A to 50 A 0.01 Ω to 1 Ω

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Protection Against Electric Shock	IS 10322 (Part 1, Section 8) IS10322 (Part 5, Section 1, Clause 12) IS10322 (Part 5, Section 2, Clause 2) IS10322 (Part 5, Section 3, Clause 12) IS10322 (Part 5, Section 5, Clause 12)	Qualitative (0.1 N to 10 N)
		Resistance to Dust and Moisture	IS 10322 (Part 1, Section 9) IS10322 (Part 5, Section 1, Clause 14) IS10322 (Part 5, Section 2, Clause 4) IS10322 (Part 5, Section 3, Clause 14) IS10322 (Part 5, Section 5, Clause 14)	Qualitative
		Insulation Resistance And Electric Strength Test	IS 10322 (Part 1, Section 10) IS 10322 (Part 5, Section 1, Clause 15) IS10322 (Part 5, Section 2, Clause 15) IS10322 (Part 5, Section 3, Clause 15) IS 10322 (Part 5, Section 5, Clause 15)	2 MΩ to 1 TΩ Qualitative (0.01 kV to 10 kV)
		Resistance to Heat, Fire& Tracking	IS 10322(Part 1, Section 13) IS 10322(Part 5, Section 1, Clause 16) IS 10322(Part 5, Section 2, Clause16)	Qualitative (0.01 mm to 150 mm) Qualitative (Ambient to 960°C 1 V to 600 V)

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			IS 10322(Part 5, Section 3, Clause 16) IS 10322(Part 5, Section 5, Clause 16)	
III.	**POWER SUPPLIES & STABILIZERS**			
1.	**Uninterruptible power systems (UPS)**	Power Interface (excluding testing With Non-Linear Load)	IEC 62040-1 (Clause 4.6)	Current-0.1 A to 30 A AC Voltage: 0.1 V to 300 V Power-1W to 5000 W
		Markings and Instructions	IS 16242(Part 1) IEC 62040-1 (Clause 4.7)	Qualitative
		Protection For UPS Intended to be used in operator access areas	IS 16242(Part 1) IEC 62040-1 (Clause 5.1.1)	Qualitative
		Protective earthing and bonding	IS 16242(Part 1) IEC 62040-1 (Clause 5.3)	AC Voltage: 0.01 V to 9.99 V Current:0.01 A to 50A
		Over current and earth fault protection	IS 16242(Part 1) IEC 62040-1 (Clause 5.5)	Qualitative
		Clearance, Creepage	IS 16242(Part 1) IEC 62040-1 (Clause 5.7) RD(2.10.3 & 2.10.4)	0.01mm to 300 mm
		Stability	IS 16242(Part 1) IEC 62040-1 (Clause 7.2)	Qualitative
		Mechanical Strength	IS 16242(Part 1) IEC 62040-1 (Clause 7.3) RD (Clause 4.2.1 to 4.2.7)	Qualitative
		Temperature Rise	IS 16242(Part 1) IEC 62040-1 (Clause 7.7)	Temperature: 0.1 ˚C to 400 ˚C
		General Provision For Earth Leakage	IS 16242(Part 1) IEC 62040-1 (Clause 8.1)	0.01 mA to 4 mA

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Electric Strength	IS 16242(Part 1) IEC 62040-1 (Clause 8.2)	Qualitative (0.01kV to 10 kV)
IV.	**CELLS & BATTERIES**			
1.	**Secondary cells and batteries containing alkaline or other non acid electrolytes safety requirements for portable sealed secondary cells and for batteries made from them for use in portable applications**	Continuous low rate charging(Cells)	IS 16046 IEC 62133 (Clause 7.2.1)	Qualitative Upto 28 Vdc, 20 A
		Vibration	IS 16046 IEC 62133 (Clause 7.2.2)	Qualitative
		Moulded case stress at high ambient temperature(batteries)	IS 16046 IEC 62133 (Clause 7.2.3)	Qualitative (Ambient to 300°C, Upto 10 hrs)
		Temperature Cycling	IS 16046 IEC 62133 (Clause 7.2.4)	Qualitative Upto 300 °C (-) 20°C to 0°C Upto 50°C
		Incorrect Installation (Cells)	IS 16046 IEC 62133 (Clause 7.3.1)	Qualitative Temperature :Ambient to 300°C Resistance:1Ω
		External short circuit	IS 16046 IEC 62133 (Clause 7.3.2)	Qualitative Temperature :Ambient to 300°C Resistance:0.1Ω
		Free fall	IS 16046 IEC 62133 (Clause 7.3.3)	Qualitative
		Mechanical Shock (Crash Hazard)	IS 16046 IEC 62133 (Clause 7.3.4)	Qualitative
		Thermal Abuse(Cells)	IS 16046 IEC 62133 (Clause 7.3.5)	Qualitative (Ambient to 300°C)
		Crushing of cells	IS 16046 IEC 62133 (Clause 7.3.6)	Qualitative
		Low pressure cells	IS 16046 IEC 62133 (Clause 7.3.7)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Over charge for nickel systems	IS 16046 IEC 62133 (Clause 7.3.8)	Qualitative 0.1 to 28Vdc, 20 A
		Forced discharge cells	IS 16046 IEC 62133 (Clause 7.3.9)	Qualitative 0.1 to 28Vdc, 20 A
		Continuous charging at constant voltage (Cells)	IS 16046 IEC 62133 (Clause 8.2.1)	Qualitative 0.1 to 28Vdc, 20 A
		Moulded case stress at high ambient temperature(batteries)	IS 16046 IEC 62133 (Clause 8.2.2)	Qualitative ambient to 300°C.LC1°C 0.1-10 hrs LC 0.01/0.1 sec
		External short circuit (Cells)	S 16046 IEC 62133 (Clause 8.3.1)	Qualitative Temp.:ambient 300°C.LC0.1°C
		External short circuit (battery)	S 16046 IEC 62133 (Clause 8.3.2)	Qualitative Temp.:ambient 300°C Resistance:0.1Ω
		Free fall	IS 16046 IEC 62133 (Clause 8.3.3)	Qualitative
		Thermal Abuse (Cells)	IS 16046 IEC 62133 (Clause 8.3.4)	Qualitative Ambient to 300°C
		Crush (cells)	IS 16046 IEC 62133 (Clause 8.3.5)	Qualitative
		Over charge of battery	IS 16046 IEC 62133 (Clause 8.3.6)	Qualitative 0.1 to 28Vdc, 20 A
		Forced discharge cells	IS 16046 IEC 62133 (Clause 8.3.7)	Qualitative 0.1to 28Vdc, 20 A
V.	**SAFETY TEST FACILITY-TOYS**			
1.	**Safety of Electrical Toys (Excluding Wheeled Ride on Toys)**	Marking and instructions	IS 15644 (Clause 7)	Qualitative
		Power Input	IS 15644 (Clause 8)	1 W to 5000 W
		Heating and abnormal operation	IS 15644 (Clause 9)	Temp.:0.1^{0}C to 400 ^{0}C LC-0.1^{0}C

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		electric strength at operating temperature	IS 15644 (Clause 10)	Qualitative 0.1 kV to 10 kV
		Moisture resistance	IS 15644 (Clause 11)	Qualitative 10°C to 40°C 40 % to 96 %
		electric strength at room temperature	IS 15644 (Clause 12)	Qualitative 0.01 kV to 10 kV
		Mechanical Strength	IS 15644 (Clause 13)	Qualitative
		Construction	IS 15644 (Clause 14)	Qualitative
		Protection of cords and wire	IS 15644 (Clause 15)	Qualitative
		Components(Visual Testing Certified Component Only)	IS 15644 (Clause 16)	Qualitative
		Screws and connections	IS 15644 (Clause 17)	Qualitative
		Clearances Creep age distances	IS 15644 (Clause 18)	Upto 150 mm
		Resistance to heat & fire	IS 15644 (Clause 19)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection

ELECTRONICS TESTING

I.	**SAFETY TESTING FACILITY**			
1.	**Information Technology Equipment**	Power Interface	IS 13252 (Part 1) +A1+A2 (Clause 1.6)	Current: 0.1 A to 30A, AC Voltage: 1 V to 300 V Power: 1 W to 5000 W
		Verification Of Marking	IS 13252 (Part 1) +A1+A2 (Clause 1.7)	Qualitative
		Access to Energized Part	IS 13252 (Part 1) +A1+A2 (Clause 2.1.1.1)	Qualitative
		Provisions for Earthing and Bonding	IS 13252 (Part 1) +A1+A2 (Clause 2.6.1, 2.6.2, 2.6.3, 2.6.4, 2.6.5)	AC Voltage: 0.01 V to 9.99 V Current: 0.01 A to 50 A
		Over Current and Earth Fault Protection in Primary Circuits	IS 13252 (Part 1) +A1+A2 (Clause 2.7)	Qualitative
		Electrical Insulation	IS 13252 (Part 1) +A1+A2 (Clause 2.9)	Up to 1 TΩ
		Clearance, Creepage	IS 13252(Part 1) +A1 +A2 (Clause 2.10.3 & 2.10.4)	0.01mm to 300mm, Wave Form Description 1.25/50µs Duration Amplitude: 1s 0.01 kV to 10 kV
		Stability	IS 13252(Part 1) +A1 +A2 (Clause 4.1)	Qualitative
		Mechanical Strength	IS 13252(Part 1) +A1+A2 (Clause 4.2.1 to 4.2.7)	Qualitative
		Thermal Requirements	IS 13252(Part 1) +A1+A2 (Clause 4.5)	Temperature :0.1 ˚C to 400 ˚C
		Resistance to Fire	IS 13252 (Part 1) +A1+A2 (Clause 4.7)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Touch Current & Protective Conductor Current	IS 13252(Part 1) +A1+A2 (Clause 5.1)	Upto 3.5 mA
		Electric Strength	IS 13252(Part 1) +A1+A2 (Clause 5.2)	Qualitative 0.01 kV to 10 kV
2.	**Self Ballasted Led Lamps For General Lighting Services**	Verification of Marking	IS 16102(Part 1) + A1 + A2 (Clause 5)	Qualitative
		Interchangeability	IS 16102 (Part 1)+ A1 + A2 (Clause 6)	Qualitative (Torque: upto 10 Nm)
		Protection against Accidental Contact with Live Parts	IS 16102(Part 1) + A1 + A2 (Clause 7)	Qualitative (Force: upto 40 N)
		Insulation Resistance and Electric Strength after Humidity Treatment	IS 16102(Part 1) + A1 + A2 (Clause 8)	Qualitative (10°C to 40°C Up to 96 RH)
				Up to 1 TΩ
				Qualitative (0.01 kV to 10 kV)
		Mechanical Strength	IS 16102(Part 1) + A1 + A2 (Clause 9)	Qualitative (Torque: upto 10 Nm)
		Cap Temperature Rise	IS 16102(Part 1) +A1+A2 (Clause 10)	Upto 300°C
		Resistance to Heat	IS 16102(Part 1) + A1 + A2 (Clause 11)	Qualitative
		Resistance to Fame and Ignition	IS 16102(Part 1) + A1 + A2 (Clause 12)	Qualitative
		Fault Condition	IS 16102(Part 1) + A1 + A2 (Clause 13)	Qualitative
		Creepage Distances and Clearances	IS 16102(Part 1) + A1 + A2 (Clause 14)	0.01 mm to 300 mm
3.	**Lamp Control Gear, LED & Florescent Lamp**	Verification of Marking	IS 15885 (Part 1) + A1 (Clause 7) IS 15885 (Part 2, Section 13) +A1(Clause 7)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			IS 15885 (Part 2, Section 3) +A1(Clause 7)	
		Protection Against Accidental Contact with Live Parts	IS 15885 (Part 1) + A1 (Clause 10) IS 15885 (Part 2, Section 13) +A1(Clause 8) IS 15885 (Part 2, Section 3) +A1(Clause 8)	Qualitative (Force: upto 500 N)
		Provision for Protective Earthing	IS 15885 (Part 1) +A1 (Clause 9) IS 15885 (Part 2, Section 13) +A1(Clause 10) IS 15885 (Part 2, Section 3) +A1(Clause 10)	AC Voltage:0.01 V to 9.99 V Current:0.01 A to 50 A Distance Upto 300 mm
		Moisture Resistance and Insulation	IS 15885 (Part 1) +A1 (Clause 11) IS 15885 (Part 2, Section 13) +A1(Clause 11) IS 15885 (Part 2, Section 3) +A1(Clause 11)	Qualitative (10°C to 50°C Up to 95% RH) Up to 1 TΩ
		Electric Strength	IS 15885 (Part 1) +A1 (Clause 12) IS 15885 (Part 2, Section 13) +A1(Clause 12) IS 15885 (Part 2, Section 3) +A1(Clause 12)	Qualitative (0.01 kV to 10 kV)
		Creepage Distances and Clearances	IS 15885 (Part 1) +A1 (Clause 16) IS 15885 (Part 2, Section 13) +A1(Clause 17) IS 15885 (Part 2, Section 3) +A1(Clause 18)	0.01 mm to 300 mm

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Resistance to Heat, Fire and Tracking	IS 15885 (Part 1) +A1 (Clause 18) IS 15885 (Part 2, Section 13) +A1(Clause 19) IS 15885 (Part 2, Section 3) +A1(Clause 20)	Qualitative
4.	**Audio Video And Similar Electronic Apparatus**	Verification of Marking	IS 616 IEC 60065 (Clause 5)	Qualitative
		Heating Under Normal Operating Conditions	IS 616 IEC 60065 (Clause 7.1)	Temperature: 0.1 ˚C to 400 ˚C
		Electric Shock Hazard Under Normal Operating Conditions	IS 616 IEC 60065 (Clause 9)	Qualitative (AC Voltage: Upto 1000 V, DC Voltage: upto 1000 V, Force up to 500 N)
		Insulation Requirements	IS 616 IEC 60065 (Clause 10)	Upto 1 TΩ Ac Voltage: Upto 10 kV 10°C to 40°C Upto 96 % RH
		Mechanical Strength	IS 616 IEC 60065 (Clause 12)	Qualitative (Force: upto 500 N)
		Clearance, Creepage	IS 616 IEC 60065 (Clause 13.3 & 13.4)	0.01 mm to 300 mm Wave Form Description: 1.25/50µs Duration Amplitude: 1 s 0.01 kV to 10 kV
		Provision for Protective Earthing	IS 616 IEC 60065 (Clause 15.2)	AC Voltage: 0.01 V to 9.99 V Current:0.01 A to 50 A
		Device Formatting a Part of the Mains Plug	IS 616 IEC 60065 (Clause 15.4)	Qualitative (Torque: upto 10 Nm Hot Air Oven: upto 300 °C)

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Stability & Mechanical Hazard	IS 616 IEC 60065 (Clause 19.1 to 19.4)	Qualitative (Force: upto 500 N)
II.	**ENVIRONMENTAL TEST FACILITY**			
1.	**Electronic Items/Electrical Items/Automotive Items/ Equipments/ Microcircuits**	Cold Test	IS 9000 (Part 2, Section 1 to 4)	Qualitative Ambient to (-)20°C (Dimension: 1.8m X 1.2m X 1.2m)
		Dry Heat Test	IS 9000 (Part 3, Section 1 to 5)	Qualitative Ambient to 250°C (Dimension: 1.8m X 1.2m X 0.9m)
		Change of Temperature	IS 9000 (Part 14, Section 1 to 3) IS/IEC 61196-1-206	Qualitative Ambient to (-)20°C (Dimension: 1.8m X 1.2m X 1.2m) Qualitative Ambient to 250°C (Dimension: 1.8m X 1.2m X 0.9m)
		Damp Heat (Steady State) Test	IS 9000 (Part 4) IEC 60068-2-78	Qualitative 25 °C to 50 °C 40% RH to 95% RH (Dimension: 1.8m X 1.2m X 1.2m)
		Damp Heat (Cyclic) Test	IS 9000 (Part 5, Section 1 & 2)	Qualitative 25°C to 50°C 40% RH to 95% RH (Dimension: 1.8m X 1.2m X 1.2m)

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Dust Test	IS 9000 (Part 12)	Qualitative (Dimension: 0.9m X 0.6m X 0.9m)
		Composite Temperature & Humidity Test	IS 9000 (Part 6)	Qualitative Ambient to (-)20°C (Dimension: 1.8m X 1.2m X 1.2m) Qualitative 25°C to 65°C 40% RH to 95% RH (Dimension: 1.8m X 1.2m X 1.2m)
		Vibration Test	IS 9000 (Part 8)	Qualitative (5 Hz to 7kHz, Force: upto 600 kgf)
		Mechanical Shock Test	IS 9000 (Part 7, Section 1)	Qualitative
		Drop &Topple Test	IS 9000 (Part 7, Section 3)	Qualitative (Drop Height: 25, 50, 100, 250, 500 mm)
		Free fall Test	IS 9000 (Part 7, Section 4)	Qualitative (Drop Height: 25, 50, 100,250,500,1000 mm)
		Free fall Repeated	IS 9000 (Part 7, Section 5)	Qualitative (Number of fall: 50, 100 200, 500, 1000)
		Low Air Pressure Test/Altitude Test	IS 9000 (Part 13)	Qualitative (2.66 kPa to 99.99 kPa) (Dimension: 0.6m X 0.5m X 0.8m)
		Robustness of Terminations Test	IS 9000 (Part 19, Section 1 to 5)	Qualitative
		Resistance to Cleaning Solvents and permanence	IS 9000 (Part 20)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		of Markings		
		Degrees of Protection Provided by Enclosures (IP Code)	IS/IEC 60529 + A1 + A2	Qualitative (1X,2X,3X,4X,5X,6X) (X1,X2,X3,X4,X5,X6,X7, X8)

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		MECHANICAL TESTING		
I.	**BUILDING MATERIALS**			
1.	**Cement**	Fineness By Blaine's Air Permeability	IS 4031(Part 2)	100 m^2/kg to 600 m^2/kg
		Soundness by-Le-Chatelier	IS 4031(Part 3)	0.5 mm to 20 mm
		Soundness-Autoclave	IS 4031(Part 3)	0.01 % to 1.5%
		Consistency	IS 4031(Part 4)	15 % to 40 %
		Initial Setting Time	IS 4031(Part 5)	10 minutes to 400 minutes
		Final Setting Time	IS 4031 (Part 5)	100 minutes to 600 minutes
		Compressive Strength	IS 4031(Part 6)	2 N/mm^2 to 90 N/mm^2
		Drying Shrinkage	IS 4031(Part 10)	0.02 % to 2 %
		Whiteness	IS 8042	60 % to 99 %
		Density/Specific Gravity	IS 4031(Part 11)	1.5 g/cm^3 to3.5 g/cm^3
		Fineness by Dry Sieving	IS 4031(Part 1)	0.2 % to 30%
2.	**Pozzolana**	Fineness by Blaine's Air Permeability	IS 1727	100 m^2/kg to 600 m^2/kg
		Particles retained on 45µ IS Sieve	IS 1727	2 % to 50 %
		Lime Reactivity	IS 1727	1 N/mm^2 to 20 N/mm^2
		Compressive Strength	IS 1727	50 % to 95 %
		Soundness by Autoclave	IS 1727	0.01 % to 1.5 %
		Specific Gravity/Density	IS 1727	1.0 g/cm^3 to 3.2 g/cm^3
		Drying Shrinkage	IS 4031(Part 10)	0.01 % to 2 %
3.	**Aggregates**	Crushing Value	IS 2386 (Part 4)	1 % to 60%
		Impact Value	IS 2386 (Part 4)	1 % to 60 %
		Abrasion Value	IS 2386 (Part 4)	1 % to 70 %
		10% Fines value	IS 2386 (Part 4)	1 kN to 500 kN

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Sieve Analysis	IS 2386 (Part 1)	100 mm to 0.150 mm
		Specific Gravity	IS 2386 (Part 3)	2 to 4
		Water Absorption	IS 2386 (Part 3)	0.02 % to 5 %
		Bulk Density	IS 2386 (Part 3)	1.0 kg/l to 2.2 kg/l
		Flakiness Index	IS 2386 (Part 1)	1 % to 50 %
		Elongation Index	IS 2386 (Part 1)	1 % to 50 %
		Bulking of Fine Aggregate	IS 2386(Part 3)	1.01 % to 11.1 %
		Moisture Content	KTRC/BM/SOP-09 Issue No. 1 Dated 01.04.2018	0.1 % to 40 %
		Finesse Modulus	KTRC/BM/SOP-26 Issue No. 1 Dated 01.04.2018	0.8 to 6.0
		Mortar making properties of fine aggregates	IS 2386(Part 6)	2 N/mm^2 to 30 N/mm^2
		Silt content	IS 2386 (Part 2)	0.05 % to 40 %
		Material Finer than 75 µ/Silt Content	IS 2386 (Part 1)	0.5 % to 6 %
		Stone Polish Value	IS 2386(Part 4)	20 to 120
4.	**Bentonite**	Sand Content	IS 6186	0.1 % to 20%
		Free Swell	IS 6186	Upto 100 %
		pH	IS 6186	1 to 13
		Density	IS 6186	1 g/ml to 2.2 g/ml
		Liquid Limit	IS 2720 (Part 5)	40 % to 80 %
		Plastic Limit	IS 2720 (Part 5)	30 % to 50 %
5.	**Bitumen & Bitumen Mix**	Softening Point	IS 1205	30 °C to 80 °C
		Penetration	IS 1203	30 DIV. to 150 DIV.
		Ductility	IS 1208	10 cm to 100 cm
		Marshal Stability/Flow	ASTM D1559	500 kg to 1800 kg 0.1 mm to 6.0mm
		Bitumen Binder Content	ASTM D2172	1 % to 25%

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
6.	**Concrete**	Compressive Strength	IS 516	1 N/mm^2 to 84 N/mm^2
		Flexural/Transverse Strength	IS 516	0.5 N/mm^2 to 30 N/mm^2
		Permeability of Concrete	IS 3085	1 m/sec to $50x10^{-12}$ m/sec
		Water Absorption	IS 2185(Part 1)	0.1 % to 10%
7.	**Hollow & Solid Concrete Block**	Dimension	IS 2185(Part 1) IS 2185(Part 2)	80 mm to 800 mm
		Water Absorption	IS 2185(Part 1) IS2185(Part 2)	0.1 % to 10 %
		Block Density	IS 2185(Part 1) IS 2185(Part 2)	1000 kg/m^3 to 2000 kg/m^3
		Drying Shrinkage	IS 2185(Part 1) IS 2185(Part 2)	0.01 % to 0.2 %
		Moisture Movement	IS 2185(Part 1) IS 2185(Part 2)	0.01 % to 0.2 %
		Compressive Strength	IS 2185(Part 1) IS 2185(Part 2)	2 N/mm^2 to 30 N/mm^2
8.	**AAC Block**	Dimension	IS 2185(Part 3)	80 mm to 800 mm
		Block Density	IS 2185(Part 3) IS 6441(Part 1)	300 kg/m^3 to 1100 kg/m^3
		Drying Shrinkage	IS 2185(Part 3) IS 6441(Part 2)	0.01 % to 0.2%
		Compressive Strength	IS 2185(Part 3) IS 6441(Part 5)	1 N/mm^2 to 20 N/mm^2
		Thermal Conductivity	IS 2185(Part 3) IS 3346	0.1 W/mK to 0.8 W/mK
9.	**Bricks**	Dimension & Dimensional Tolerance	IS 1077	20 mm to 5000 mm
		Dimension -Pulverized Fuel Ash-Lime Bricks -Common Burnt Clay Building Bricks -Burnt Clay Fly Ash	 IS 12894 IS 1077 IS 13757	 20 mm to 5000 mm 20 mm to 5000 mm 20 mm to 5000 mm

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Building Bricks		
		Drying Shrinkage	IS 4139	0.01 % to 1 %
		Compressive Strength	IS 3495(Part 1)	2 N/mm^2 to 30 N/mm^2
		Water Absorption	IS 3495 (Part 2)	1 % to 30%
		Efflorescence	IS 3495 (Part 3)	Qualitative
10.	**Paver Block**	Visual Inspection	IS 15658	Qualitative
		Dimension, Area-Plan, Wearing Face Thickness of wearing layer Squareness, Length, Width	IS 15658	40 mm to 500 mm
		Water Absorption	IS 15658	0.1 % to 10 %
		Compressive Strength	IS 15658	20 N/mm^2 to 100 N/mm^2
		Flexural Strength	IS 15658	1 $N/mm^2$to 15 N/mm^2
		Abrasion Test(Loss in volume)	IS 15658	1000 to 50000 $mm^3/5000mm^2$
		Freeze-Thaw Durability	IS 15658	Qualitative
		Tensile Splitting Strength	IS 15658	1 N/mm^2 to 30 N/mm^2
11.	**Concrete Tiles**	Dimensions	IS 1237 IS 13801 IS 10646 IS 8968	10 mm to 600 mm
		Flatness	IS 1237 IS13801 IS 10646 IS 8968	0.1 mm to 1 mm
		Perpendicularity	IS 1237 IS 13801 IS 10646 IS 8968	0.01% to 2 %
		Straightness	IS 1237 IS13801 IS 10646	0.01% to 1.5 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			IS 8968	
		Water Absorption	IS 1237 IS 13801 IS 10646 IS 8968	1% to 15 %
		Wet Transverse Strength	IS 1237 IS 13801 IS 10646 IS 8968	1 N/mm^2 to 10 N/mm^2
		Resistance to wear	IS 1237	0.1 mm to 5mm
12.	**Ceramic Tiles**	Dimensions	IS 13630 (Part 1)	5 mm to 1300 mm
		Water Absorption	IS 13630 (Part 2)	0.01 % to 20 %
		Co-efficient of Linear Thermal Expansion	IS 13630 (Part 4)	$1X10^{-6}$ to $9 X10^{-6}$
		Resistance to Thermal Shock	IS 13630 (Part 5)	Qualitative
		Modulus of Rupture	IS 13630 (Part 6)	0.1 N/mm^2 to 60 N/mm^2
		Breaking Strength	IS 13630 (Part 6)	100 N to 5000 N
		Chemical Resistance	IS 13630 (Part 7& 8)	Qualitative
		Crazing Resistance	IS 13630 (Part 9 & 11)	Qualitative
		Scratch Hardness of Surface	IS 13630 (Part 13)	1 Mohs to 10 Mohs
		Bulk Density	IS 13630 (Part 2)	1.5 g/cm^3 to 10.0 g/cm^3
		Surface Abrasion	IS 13630 (Part 2)	Qualitative (Class 0 to 5)
		Impact Resistance by measurement of coefficient of restitution	IS 13630 (Part 14)	0.3 to 0.8
		Deep Abrasion	IS 13630 (Part 12)	50 mm^3 to 200 mm^3
13.	**Thermoplastic Road Marking Material**	Binder Content	BS 3262(Part 1)	0.5 % to 80 %
		Glass Bead Content	BS 3262 (Part 1)	0.5 % to 80 %
		Softening Point	BS 3262 (Part 1)	50 °C to 150 °C
		Grading Constituent	BS 812 (Part 103)	300 µm to 75 µm

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Free Flow Test	MORTH Section 803	Qualitative
14.	**Natural Building Stones**	Dimensions	IS 1130	Upto 3000 mm
		Hardness	MOHS Scale	1 Mohs to 10 Mohs
		Specific Gravity/Density	IS 1122 IS 1124	1.0 to 4.0
		Water Absorption	IS 1124	0.1 % to 10%
		Compressive Strength	IS 1121(Part 1)	Upto 1500 kg/cm^2
		Point Load Strength	IS 9143	5 kg/cm^2 to 800 kg/cm^2
		Transverse Strength	IS 1121(Part 2)	1 MPa to 35 MPa
		Moisture Content	IS 13030	0.01 % to 10 %
		Porosity	IS 1124	0.50 to 3
		Dry Density	IS 13030	1000 kg/m^{3}to 5 000 kg/m^3
II.	**SOIL & ROCK**			
1.	**Soil**	Grain Size Analysis	IS 2720(Part 4)	0.045 mm to 4.75 mm
		Moisture content	IS 2720(Part 2)	0.2 % to 35 %
		Specific Gravity	IS 2720(Part 3)	1 to 3
		Free Swell Index	IS 2720(Part 40)	0.1% to 70 %
		Liquid Limit	IS 2720(Part 5)	20 % to 80 %
		Plastic Limit	IS 2720(Part 5)	10 % to 40 %
		Shrinkage Limit	IS 2720(Part 6)	5 % to 40%
		CBR Value	IS 2720(Part 16)	1% to 60 %
		Heavy compaction: Maximum Dry Density Heavy Compaction: Optimum Moisture Content	IS 2720(Part 8)	1 g/cm^3 to 3 g/cm^3 1 % to 20 %
		Light compaction: Maximum Dry Density Light Compaction: Optimum Moisture Content	IS 2720(Part 7)	1 g/cm^3 to 3 g/cm^3 1 % to 20 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Permeability Test	IS 2720 (Part 17)	10^{-1} cm/s to 10^{-8} cm/s
		Swelling Pressure Test	IS 2720 (Part 41)	0.01 N/mm^2 to 1N/mm^2
		Direct Shear Test	IS 2720 (Part 13)	C: Upto 1 kg/cm^2 ϕ: 5° to 50°
		Triaxial Shear Test	IS 2720 (Part 12)	C:Upto 4 kg/cm^2 ϕ: 0° to 25°
		Consolidation	IS 2720(Part 15)	1 cm^2/sec to 30X10^{-4} cm^2/sec
		UCS of soil	IS 2720 (Part 10)	Upto 500 kN/m^2
		Density	IS 2720 (Part 14)	0.5 g/cm^3 to 3 g/cm^3
III.	**MECHANICAL PROPERTIES OF MATERIALS**			
1.	**Ferrous & Non Ferrous Materials Ferrous**	Tensile Strength	IS 1608 ASTM A 370 ASME Section IX EN 895 API 1104	50 N/mm² to 2500 N/mm²
		Yield Strength/Yield Point/0.2% Proof Stress	IS 1608 ASTM A 370 EN 895 API 1104	50 N/mm² to 2500 N/mm²
		Elongation	IS 1608 ASTM A 370 EN 895 API 1104	0.5 % to 80 %
		Reduction in Area	IS 1608	0.5 % to 80 %
		Bend Test	IS1599 ASTM A 370 ASME Section IX EN 910	Qualitative (Mandrel Diameter Pencil Type: 7, 10, 15, 18, 20, 24, 30, 40,50 mm Flus/Non-Flus Type: 12, 16, 18, 20, 24, 30, 32, 36, 40, 44, 48, 50, 56

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
				60, 64, 70, 72, 80, 100, 120, 125, 128 mm Hand Round Type: 75, 84, 96, 108, 112, 140, 144, 150, 160, 168, 175, 180, 192, 196, 200, 216, 224, 225, 252, 280, 288, 320 mm)
		Rockwell Hardness	IS 1586(Part 1)	20 HRC to 70 HRC 30 HRBW to 100 HRBW 20 HRA to 88 HRA
		Brinell Hardness	IS 1500 (Part 1) ASTM A 370	8 HBW to 650 HBW (2.5/187.5, 2.5/250,5/750,10/1000 &10/3000)
		Vickers Hardness	IS 1501(Part 1) EN 1043-1	20 HV_5 to 1500 HV_5 50 HV_{10} to 1000 HV_{10} 100 HV_{20} to 1000 HV_{20} 130 HV_{30} to 1000 HV_{30} 190 HV_{50} to 1000 HV_{50}
		Impact Charpy V-Notch	IS 1757 (Part 1)	2 J to 300 J Temperature: Ambient to – 20 °C
		Charpy U-NOTCH	IS 1499	2 J to 300 J
		Izod Impact	IS 1598	2 J to 168.5 J
		Proof load	IS 1367 (Part 3)	50 N to 900000 N
		Flattening test	IS2328 ISO 8492	OD: Upto 600 mm
		Cupping test	IS 10175 ISO 8490	Thickness: upto 2mm
		Nick Break Test	API 1104 ASME Section IX IS 5504 (Annexure A)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Tube Drift Expanding Test	IS 2335 ISO 8493	Upto 150 mm
		Dimension	IS 1929 IS 10102 IS 808 IS1363(Part 3) IS 1730	0.01 mm to 15000mm
		Macro examination	IS11371 EN 1321	Qualitative (Magnification: 3X & 6X)
		Sulphur Print	IS12037	Qualitative
2.	**High Strength Deformed Steel Bar**	Weight	IS 1786s IS 16651 KTRC/MECH/SOP/01 Issue No. 03 Date: 01.04.2018	0.05 kg/m to 50 kg/m
		Re-bend Test	IS 1786 IS 16651	Qualitative (Mandrel Diameter Pencil Type: 7, 10, 15, 18, 20, 24, 30, 40,50 mm Flus/Non-Flus Type: 12, 16, 18, 20, 24, 30, 32, 36, 40, 44, 48, 50, 56 60, 64, 70, 72, 80, 100, 120, 125, 128 mm Hand Round Type: 75, 84, 96, 108, 112, 140, 144, 150, 160, 168, 175, 180, 192, 196, 200, 216, 224, 225, 252, 280, 288, 320 mm)
		Pull out Test	IS2770(Part 1)	50 N/mm^2 to 2500 N/mm^2

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
3.	**Ply Strand Wire/Indented Wire/Pre-Stressed Wire/ Steel Wire/HDS Wire/HTS Wire/ Wire Ropes -3 Ply Strand 6003/6006 Metals**	Breaking Load	IS 1608	20 kN to 800 kN
		Mass of Strand	IS 14268	300 kg/km to 1200 kg/km
		Elongation	IS 14268	0.5 % to 80 %
		Dimension	IS 14268 IS 7887	0.1 mm to 200mm
		Bend/Reverse Bend	IS 1716 IS 1403(Part 1)	Qualitative (Mandrel Diameter Pencil Type: 7, 10, 15, 18, 20, 24, 30, 40,50 mm Flus/Non-Flus Type: 12, 16, 18, 20, 24, 30, 32, 36, 40, 44, 48, 50, 56 60, 64, 70, 72, 80, 100, 120, 125, 128 mm Hand Round Type: 75, 84, 96, 108, 112, 140, 144, 150, 160, 168, 175, 180, 192, 196, 200, 216, 224, 225, 252, 280, 288, 320 mm)
		Lay Length	IS 14268	100 mm to 300 mm
		Wrapping Test	IS 1755	Qualitative
		Pencil Hardness Test	IS 14246	Qualitative
		Cross Hatch Test	IS 14246	Qualitative
		Impact Test	IS 14246	Qualitative
		Bend Test	IS 14246	Qualitative
IV.	**PLASTICS & POLYMERS**			
1.	**Plastics**	Melt Flow Index Melt Flow Rate	IS 2530 (Clause 7) IS 7328 (Clause 5.2.1.2) IS13360 (Part 4, Section 1)	0.1 g to 50 g/10minutes
		Carbon Black Content	IS 2530 (Clause 10)	0.1 % to 10 %

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Density Specific Gravity	IS 7328 (Clause 5.2.1.1) IS 12235 (Part 14) IS 13360(Part 3, Section 1)	0.01 g/cm^3 to 3.0 g/cm^3 0.01 to 3.0
		Hydraulic Characteristics Hydrostatic Characteristics Hydrostatic Pressure Internal Hydrostatic Pressure	IS 4984 (Clause 8.1) IS 4985 (Clause 11.1) IS 12786 (Clause 7.1 Annexure C) IS 13487 (Clause 7.3) IS 13488 (Clause 8.4) IS12235 (Part 8, Section 1)	0.01 bar to 99.99 bar
		Brimful Capacity	IS 2798 (Clause 5.1)	100 ml to 25 l
		Transparency	IS 15410 (Clause 4.6.2 Annexure A) IS 14625 (Clause 5.3.2, Annexure C)	1% to 100%
		Opacity	IS 12235(Part 3) IS 7834 (Part 1) (Clause 6.2 Appendix B)	Upto 100 %
		Vicat Softening Temperature	IS 12235 (Part 2)	60 °C to100 °C
		Resistance to external Blow	IS 12235(Part 9) IS 4985 (Clause 11.2 Annexure C)	Upto 10%
		Thickness of Film	IS 2508 (Clause 5.2.2, Annexure A)	0.001 mm to 1 mm
		Longitudinal Reversion	IS 4984 (Clause 8.2) IS 4985 (Clause 10.4) IS 12235 (Part 5, Section1)	(-) 10 % to (+) 10 %
		Tensile Strength at Break Tensile Strength	IS 2530 (Clause 6) IS12235 (Part 13)	5 MPa to 100 MPa
		Elongation at break	IS 2530 (Clause 6) IS12235 (Part 13)	20 % to 1500 %
		Seam Strength (Jute Bag)	IS 9030	10 kgf/cm to 1000 kgf/cm

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Impact Resistance of Film	IS 13360 (Part 5, Section 6, Annexure A)	Qualitative
		Drop Impact Test Drop test	IS 2798 (Clause 8.1) IS14625 (Clause 5.3.4, Annexure D) IS 14735 (Clause 16.1, Annexure C) IS 15609 (Clause 7.3, Annexure G)	Qualitative
		Resistance To Sulphuric Acid	IS 12235 (Part 7)	0.05 g to 5 g
		Hardness	ASTM D 2240	10 Shore D to 100 Shore D 1 Shore A to 100 Shore A
		Threading of Pipes	IS 12818 (Clause 8)	Qualitative
		Dimensions	IS 12235(Part 1) IS 4984 (Clause 7.4) IS 2798 (Clause 4.4) IS 12786 (Clause 5)	0.01 mm to 15000 mm
		Tear Resistance	IS 13360 (Part 5, Section 23)	1 N to 50 N
		Overall Migration	IS 9845	1 mg/l to 100 mg/l 1 mg/dm^2 to 100 mg/dm^2
		Stress Relief Test	IS 12235 (Part 6)	Qualitative
V.	**RUBBER AND RUBBER PRODUCTS**			
1.	**Rubber**	Hardness	ASTM D 2240	10 Shore D to 100 Shore D 1 Shore A to 100 Shore A
		Change In Volume (Water Immersion)	IS 3400 (Part 6)	Upto 50 %
		Water Absorption	IS5382	Upto 50%

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Tensile Strength	IS 3400 (Part 1)	5 MPa to 100 MPa
		Elongation At break	IS 3400 (Part 1)	20 % to 1200 %
		Density	IS 3400 (Part 9)	100 kg/m^3 to 3000 kg/m^3 0.01 to 3.0
VI.	**TOYS AND SIMILAR PRODUCTS**			
1.	**Safety of Toys (Safety aspects related to mechanical and physical properties)**	Small parts test	IS 9873(Part 1,Clause 5.2)	Qualitative
		Test for shape and size of certain toys	IS 9873(Part 1,Clause 5.3)	Qualitative
		Small balls test	IS 9873(Part 1,Clause 5.4)	Qualitative
		Test for pompoms	IS 9873(Part 1,Clause 5.5)	Qualitative
		Test for pre-school play figures	IS 9873(Part 1,Clause 5.6)	Qualitative
		Accessibility of a part or component	IS 9873(Part 1,Clause 5.7)	Qualitative
		Sharp-edge test	IS 9873(Part 1, Clause 5.8)	Qualitative
		Sharp point test	IS 9873(Part 1,Clause 5.9)	Qualitative
		Thickness of plastic film and sheeting	IS 9873 (Part 1,Clause 5.10)	Qualitative
		Test for cords	IS 9873 (Part 1, Clause 5.11)	Qualitative
		Cord Thickness	IS 9873 (Part 1, Clause 5.11.1)	Qualitative
		Self Retracting Pull Cords	IS 9873 (Part 1 Clause 5.11.2)	Qualitative
		Electric Resistance of Cords	IS 9873 (Part 1 Clause 5.11.3)	Qualitative
		Stability and overload Tests	IS 9873 (Part 1,Clause 5.12)	Qualitative
		Test for closures and toy chest lids	IS 9873 (Part 1,Clause 5.13)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Impact test for toys that cover the face	IS 9873 (Part 1, Clause 5.14)	Qualitative
		Determination of speed of electrically driven ride-on toys	IS 9873 (Part 1, Clause 5.17)	Qualitative
		Temperature increases	IS 9873 (Part 1, Clause 5.18)	Temperature : Upto 400 ^{0}C
		Leakage of liquid-filled toys	IS 9873(Part 1, Clause 5.19)	Qualitative
		Expanding materials	IS 9873(Part 1,Clause 5.21)	Qualitative
		Folding or sliding mechanisms	IS 9873(Part 1,Clause 5.22)	Qualitative
		Reasonably foreseeable abuse tests	IS 9873(Part 1, Clause 5.24)	Qualitative
		Drop Test	IS 9873(Part 1, Clause 5.24.2)	Qualitative
		Tip Over Test for Large and bulky Toys	IS 9873(Part 1, Clause 5.24.3)	Qualitative
		Tension Test	IS 9873(Part 1, Clause 5.24.6)	Qualitative
		Compression Test	IS 9873(Part 1, Clause 5.24.7)	Qualitative
		Flexure Test	IS 9873(Part 1, Clause 5.24.8)	Qualitative
		Static strength for toy scooters	IS 9873(Part 1, Clause 5.26)	Qualitative
		Strength of toy scooter steering tubes	IS 9873(Part 1, Clause 5.29)	Qualitative
		Tension Test for Magnets	IS 9873(Part 1, Clause 5.31)	Qualitative
		Magnetic Flux Index	IS 9873(Part 1, Clause 5.32)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Impact test for magnets	IS 9873(Part 1, Clause 5.33)	Qualitative
		Soaking Test for Magnet	IS 9873(Part 1, Clause 5.34)	Qualitative
		Determination of Projectile Range	IS 9873(Part 1, Clause 5.35)	1 cm to 1500 cm
		Tip assessment of rigid projectiles	IS 9873(Part 1, Clause 5.36)	Qualitative
		Length of suction cup projectiles	IS 9873(Part 1, Clause 5.37)	Qualitative
2.	**Safety of Toys (Flammability)**	Flammability test relating to beards, moustaches, wigs, etc made from hair, pile or material that behaves in a similar manner to hair (e.g. Free-hanging ribbons, paper, cloth strands or other flowing elements) which protrude 50 mm or more from the surface of the toy	IS 9873(Part 2, Clause 5.2)	Qualitative
		Test relating to beards, moustaches, wigs, etc made from hair, pile or material that behaves in a similar manner to hair (e.g. Free-hanging ribbons, paper, cloth strands or other flowing elements) which protrude less than 50 mm from the surface of the toy and full or partial moulded head	IS 9873(Part 2, Clause 5.3)	Qualitative

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		masks		
3.	**Safety of Toys (Swings, Slides and Similar Activity toys for Indoor and Outdoor family domestic use)**	Stability	IS 9873(Part 4, Clause 6.1)	Qualitative
		Stability of Activity toys with a free height of fall of 600 mm or less	IS 9873(Part 4, Clause 6.1.1)	Qualitative
		Stability of Activity toys with a free height of fall of more than 600 mm	IS 9873(Part 4, Clause 6.1.2)	Qualitative
		Stability of Slides	IS 9873 (Part 4, Clause 6.1.3)	Qualitative
		Static Strength	IS 9873(Part 4, Clause 6.2)	Qualitative
		Test for head and neck entrapment	IS 9873(Part 4, Clause 6.5)	Qualitative
		Toggle test	IS 9873(Part 4, Clause 6.6)	Qualitative
		Test for protrusions	IS 9873(Part 4, Clause 6.7)	Qualitative
		Deflation of inflatable activity toys	IS 9873(Part 4,Clause 6.9)	1 s to 7200 s

Laboratory	**Kailtech Test and Research Centre Private Limited, 141-C, Electronic Complex Industrial Area, Pardesipura, Indore, Madhya Pradesh**		
Accreditation Standard	**ISO/IEC 17025: 2005**		
Certificate Number	**TC-7832** ***(in lieu of T-1800, T-1801, T-3484 & T-4240)***	**Page 46 of 46**	
Validity	**11.09.2018 to 10.09.2020**	**Last Amended on --**	

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection

NON-DESTRUCTIVE TESTING

I.	**BUILDING MATERIALS & REINFORCED CONCRETE STRUCTURES**			
1.	**Building Materials & Reinforced Concrete Structures**	Ultra Pulse Velocity (NDT)	IS 13311 (Part 1)	1 km/s to 6 km/s (Probe: 0.15 m to 4 m)
		Rebound Hammer	IS 13311 (Part 2)	5 N/mm^2 to 80 N/mm^2 (10 Rebound Number to 100 Rebound Number)
		Electromagnetic Cover Meter / Rebar	BS 1881 (Part 208)	Upto 100 mm Concrete Cover

Prince Garg
Convenor

Birendra Prasad Murmu
Program Manager