

Laboratory Havells India Limited, A-461/462 & SP-215, M.I.A., Alwar, Rajasthan

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-5988 (In lieu of T-2630)

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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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ELECTRICAL TESTING

I.	CABLES & WIRES			
1.	Wires and Cables: PVC Insulated (Heavy Duty) Electric Cables	Annealing for Wires used as Conductors	IS 10810 (Part 1) IS 8130 (Clause 6.2.3)	Up to 2500 N & Up to 1000 mm / 1.0 mm
		Tensile Test for Aluminium Wires	IS 10810 (Part 2) IS 8130 (Clause 6.2.1)	Up to 2500 N/ 1 N
		Wrapping Test for Aluminium Wires	IS 10810 (Part 3) IS 8130 (Clause 6.2.2)	Qualitative
	-Working voltage up to & including 1100 V	Conductor Resistance	IS 10810 (Part 5) IS 8130 (Cl. 5.2.3 to 6.3.1)	0.1 mΩ to 1999 Ω
	-Working voltage from 3.3 kV to and including 11 kV	Resistivity of Armour Wires & Strips and Conductance of Armour (Wires and Strips)	IS 10810 (Part 42) IS 3975 (Clause 7.7.1)	0.1 mΩ to 1999 Ω
	Cross-Linked Polyethylene Insulated PVC Sheathed Cables	Tensile Strength & Elongation at Break of Armouring Materials	IS 10810 (Part 37) IS 3975 (Clause 7.4)	Up to 2500 N Up to 1000 mm 0.1 Kg & 0.1 mm
	-Working voltage up to & including 1100 V	Winding on Galvanized steel strip for armouring	IS 10810 (Part 39) IS 3975 (Clause 7.6)	Mandrel diameter: 2 mm & 21 mm
	-Working voltage from 3.3 kV to and including 33 kV	Torsion on Galvanized steel wire for Armouring	IS 10810 (Part 38) IS 3975 (Clause 7.5)	Up to 999 Turns
		Uniformity of Zinc coating on steel armour	IS 10810 (Part 40) IS 3975 (Clause 7.9.2)	Qualitative
		Mass of Zinc Coating on steel Armour	IS 10810 (Part 41) IS 3975 (Clause 6.1)	0.01g to 200 g / 0.0001 g
	Cross-linked Polyethylene Insulated Thermoplastic Sheathed cable - Working voltage from 66 kV to and	Thickness of Thermoplastic and Elastomeric Insulation and Sheath	IS 10810 (P-6), IS 1554-1 (Clause 9.2, 9.3, 15.1) IS 1554-2 (Cl. 11.2 & 11.3) IS 7098-1 (Clause 9.2, 9.3, 14.3.1 and 14.3.2) IS 7098-2 (Clause 11.2, 11.3, 17.3.1 and 17.3.2) IS 7098-3 (Table No. 5,	0.01 mm to 300 mm

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	including 220 kV Polyvinyl Chloride Insulated		Table 9, 18.3.1 & 18.3.2) IS 694 (Clause 10.2–14.1) IS 14255 (Table No. 4)	
	Unsheathed and Sheathed cable / cords with Rigid & flexible conductor -Rated voltage up to and including 450 V / 750 V Aerial Bunched Cable – Working Voltage up to & including 1100 V	Tensile Strength and Elongation at Break of Thermoplastic and Elastomeric Insulation and Sheath (Before & after ageing)	IS 10810 (Part 7) IS 10810 (Part 11) IS 1554-1 (Clause 15.1) IS 5831 (Clause 4.1) IS 1554-2 (Clause 18.1) IS 5831 (Clause 4.1) IS 7098-1 (Cl. 4.1, Table 1) IS 7098-2 (Cl. 4.1, Table 1) IS 7098-3 (Cl. 5, Table 2) IS 694 (Clause 15.1) IS 5831 (Clause 4.1) IS 14255 (Cl. 5.1, Table 1)	Upto 2500 N Upto 1000 mm
		Loss of Mass	IS 10810 (Part 10) IS 1554-1 (Clause 15.1) IS 5831 (Clause 4.1) IS 1554-2 (Clause 18.1) IS 5831 (Clause 4.1) IS 694-2010 (Clause 15.1) IS 5831 (Clause 4.1)	Upto 150 °C Upto 220 g
		Hot Deformation	IS 10810 (Part 15) IS 1554-1 (Clause 15.1) IS 5831 (Clause 4.1) IS 1554-2 (Clause 18.1) IS 5831 (Clause 4.1) IS 694 (Clause 15.1) IS 5831 (Clause 4.1)	Up to 150 °C
		Heat Shock	IS 10810 (Part 14) IS 1554-1 (Clause 15.1) IS 5831 (Clause 4.1) IS 1554-2 (Clause 18.1) IS 5831 (Clause 4.1) IS 694 (Clause 15.1) IS 5831 (Clause 4.1)	Up to 200 °C

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		Shrinkage	IS 10810 (Part 12) IS 1554-1 (Clause 15.1) IS 5831 (Clause 4.1) IS 1554 -2 (Clause 18.1) IS 5831 (Clause 4.1) IS 7098-1 (Cl. 4.1 Table 1) IS 7098-2 (Cl. 4.1 Table 1) IS 7098-3 (Cl. 5, Table 2) IS 694 (Clause 15.1) IS 5831 (Clause 4.1) IS 14255 (Table 1, Cl. 5.1)	Up to 250 °C
		Thermal Stability of PVC Insulation and Sheath	IS 10810 (Part 60) IS 1554-1 (Clause 15.1) IS 5831 (Clause 4.1) IS 1554-2 (Clause 18.1) IS 5831 (Clause 4.1)	200 °C
		Insulation Resistance	IS 10810 (Part 43) IS 1554-1 (Clause 15.1) IS 5831 (Clause 4.1) IS 1554-2 (Clause 18.1) IS 5831 (Clause 4.1) IS 7098-1 (Cl. 4.1 Table 1) IS 7098-2 (Cl. 4.1 Table 1) IS 7098-3 (Cl. 5, Table 2) IS 694 (Clause 15.1) IS 5831 (Clause 4.1) IS 14255 (Cl. 5.1, Table 1)	1.0 MΩ to 10 ⁴ MΩ
		High Voltage Test	IS 10810 (Part 45) IS 1554-1 (Clause 16.2) IS 1554-2 (Clause 19.7) IS 7098-1 (Clause 16.2) IS 7098-2 (Clause 19.7) IS 7098-3 (Clause 20.17) IS 694 (Clause 16.3)	Upto 100 kV
		Water Immersion (High Voltage)	IS 10810 (Part 45) IS 1554-1 (Clause 16.3) IS 694 (Clause 16.2)	10 kV _{AC} and 1.5 kV _{DC}

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		Flammability	IS 10810(Part 53) IS 1554-1 (Clause 16.4) IS 1554-2 (Clause 19.8) IS 7098-1 (Clause 16.3) IS 7098-2 (Clause 19.8) IS 7098-3 (Clause 20.7) IS 694 (Clause 16.5)	Upto 1000 mm
		Cold Bend	IS 10810(Part 20) IS 1554-1 (Clause 15.4) IS 5831 (Clause 4.1) IS 1554-2 (Clause 15.4) IS 5831 (Clause 4.1) IS 694, IS 5831 (Cl. 4.1)	Room Temp. to (–) 40 °C
		Cold Impact	IS 10810(Part 21) IS 1554-1 (Clause 15.4) IS 5831-1984 (Clause 4.1) IS 1554-2 (Clause 15.4) IS 5831 (Clause 4.1) IS 7098-1, IS 5831 (Cl. 4.1) IS 7098-2, IS 5831 (Cl. 4.1) IS 7098-3, IS 5831 (Cl. 4.1) IS 694, IS 5831 (Cl. 4.1)	Room Temp. to (–) 40 °C
		Hot Set	IS 10810 (Part 30) IS 7098-1 (Cl. 4.1 Table 1) IS 7098-2 (Cl. 4.1 Table 1) IS 7098-3 (Table 2, Cl. 5) IS 14255 (Table 1, Cl. 5.1)	200 °C & 250 °C 0.01 mm to 150 mm
		Water Absorption (Gravimetric)	IS 10810 (Part 33) IS 1554-2 (Cl. 4.1 Table 1) IS 7098-1 (Cl. 4.1 Table 1) IS 7098-2 (Cl. 4.1 Table 1) IS 7098-3 (Table 2, Cl.5) IS 14255 (Table 1, Cl. 5.1)	0 to 100 °C 0.00001 g to 180 g
		Partial Discharge	IS 10810 (Part 46) IS 7098 Part 2 (Cl. 19.2) IS 7098 Part 3 (Cl. 20.10) IS 1554 Part 2 (Cl.19.2)	1 to 200 pC

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		Bending	IS 10810 (Part 50) IS 7098 Part 2 (Cl. 19.3) IS 7098 Part 3 (Cl. 20.11) IS 1554 Part 2 (Cl. 19.3)	Mandrel Diameter: 250 mm
		Dielectric Power Factor	IS 10810 (Part 48) IS 7098 Part 2 (Cl. 19.4) IS 7098 Part 3 (Cl. 20.12) IS 1554 Part 2 (Cl.19.4)	0.0002 to 1×10^{-5}
		Heating Cycle	IS 10810 (Part 49) IS 7098 Part 2 (Cl. 19.5) IS 7098 Part 3 (Cl. 20.14) IS 1554 Part 2 (Cl. 19.5)	Up to 100 °C
		Impulse	IS 10810 (Part 47) IS 7098 Part 2 (Cl. 19.6) IS 7098 Part 3 (Cl. 20.15) IS 1554 Part 2 (Cl. 19.6)	Upto 400 kV Upto 110 °C
		Oxygen Index	ASTM-D-2863 IS 10810 (Part 58)	Upto 100 % (L.O.I) Upto 400°C
		Temperature Index	ASTM-D-2863 IS 10810 (Part 64)	Upto 100 % (L.O.I) Upto 400 °C
		Smoke Density of Electric cables under fire conditions	ASTM-D-2843 IS 10810 (Part 63)	Upto 100 %
		Amount of Halogen Acid gas evolved during combustion of Polymeric Materials	IEC 754-1 & 2 IS 10810 (Part 59)	Upto 1000 °C
		Flame Retardant Test	IS 10810 (Part 61) SS-424-1475 Class F3 IEC 60332 (Part 3) IS 10810 (Part 62)	Upto 1000 mm 0.01 mm to 300 mm
		Copper Purity	IS 191 (Clause 3.3 & 7.2)	Upto 250 °C, Upto 9.99 A
		Fire Survival Circuit Integrity (C, W, Z Cat.)	BS 6387 IEC 60331(Part 21)	Upto 1000 °C Upto 1200 V

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		Smoke Density of Cable burning under defined condition	IEC 61034 IS 10810 (Part 63)	Upto 100 %/0.1 % Upto 12 V/0.01 V
		Longitudinal water tightness	IS 7098 Part 3 (Cl. 20.8.1) IEC 60502	0 to 3100 mm

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