

Laboratory	Havells India Limited, A-461/462 & SP-215, M.I.A. Alwar, Rajasthan		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Electrical Testing	Issue Date	05.08.2013
Certificate Number	T-2630	Valid Until	04.08.2015
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S.No.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
I. CABLES & WIRES				
1.	HT Power Cable Upto 66 kV Grade A, LT Power Cable Upto 1.1 kV Grade, Control Cables Upto 1.1 kV Grade, Ariel Bunched Cable (Upto & Including 33kV)	Annealing Test (Copper)	IS 10810(Pt-1)-1984 IS 8130-1984	Upto 2500 N & Upto 1000 mm
	As per specification	Tensile Test (Aluminium)	IS 10810(Pt-2)-1984 IS 8130-1984	Upto 2500 N
	IS: 1554(1) - 1988	Wrapping Test (Aluminium)	IS 10810(Pt-3)-1984 IS 8130-1984	Visual Check
	IS: 1554(2) - 1988	Conductor Resistance Test	IS 10810(Pt-5)-1984 IS 8130-1984	0.1 mΩ to 1999 Ω
	IS: 7098(1) - 1988	Armour Resistance Test (Resistivity)	IS 10810(Pt-42)-1984 IS 3975-1999	0.1 mΩ to 1999 Ω
	IS: 7098(2) - 1985	Tensile test & elongation on armour	IS 10810(Pt-37)-1984 IS 3975-1999	Upto 2500 N & Upto 1000 mm
	IS: 7098(3) - 1993	Winding Test on Strip	IS 10810(Pt-39)-1984 IS 3975-1999	Mandrel dia:12 mm & 21mm
	IS: 694 - 1990	Torsion Test on Wire	IS 10810(Pt-38)-1984 IS 3975-1999	Upto 999 Turns
	IS: 14255 - 1995	Uniformity of Zinc Coating	IS 10810(Pt-40)-1984 IS 3975-1999	Visual Check
		Mass of Zinc Coating	IS 10810(Pt-41)-1984 IS 3975-1999	0.1gm to 200 gm
		Thickness of insulation, Sheath & Measurement of Overall Diameter	IS 10810(Pt-6)-1984 IS 1554-1&2-1988 IS 7098-1-1988 IS 7098-2-1985 IS 7098-3-1993 IS 694-1990 IS 14255-1995	Min. 0.01 mm & Upto 300 mm

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	HT Power Cable Upto 66 kV Grade A, LT Power Cable Upto 1.1 kV Grade, Control Cables Upto 1.1 kV Grade, Ariel Bunched Cable (Upto & Including 33kV)	Tensile Strength	IS 10810(Pt-7)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 7098-1-1988 IS 7098-2-1985 IS 7098-3-1993 IS 694-1990 IS 14255-1995	Upto 2500 N & Upto 1000 mm	
		As per specification IS: 1554(1) - 1988 IS: 1554(2) - 1988 IS: 7098(1) - 1988 IS: 7098(2) – 1985 IS: 7098(3) - 1993 IS: 694 - 1990 IS: 14255 - 1995	Elongation	IS 10810(Pt-7)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 7098-1-1988 IS 7098-2-1985 IS 7098-3-1993 IS 694-1990 IS 14255-1995	Upto 2500 N & Upto 1000 mm
			Loss of Mass Test	IS 10810(Pt-10)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 694-1990	Upto 150 °C
			Hot Deformation Test	IS 10810(Pt-15)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 694-1990	Upto 150 °C
			Heat Shock Test	IS 10810(Pt-14)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 694-1990	Upto 200 °C

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	HT Power Cable Upto 66 kV Grade A, LT Power Cable Upto 1.1 kV Grade, Control Cables Upto 1.1 kV Grade, Ariel Bunched Cable (Upto & Including 33kV)	Shrinkage Test	IS 10810(Pt-12)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 7098-1-1988 IS 7098-2-1985 IS 7098-3-1993 IS 694-1990 IS 14255-1995	Upto 250 °C
	As per specification IS: 1554(1) - 1988 IS: 1554(2) - 1988 IS: 7098(1) - 1988 IS: 7098(2) – 1985 IS: 7098(3) - 1993 IS: 694 - 1990 IS: 14255 - 1995	Thermal Stability Test	IS 10810(Pt-60)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 694-1990	200 °C
		Insulation Resistance Test	IS 10810(Pt-43)-1984 IS 5831-1984 IS 1554-1&2-1988 IS 7098-1-1988 IS 7098-2-1985 IS 7098-3-1993 IS 694-1990 IS 14255-1995	1.0 MΩ to 10 ⁹ MΩ
		High Voltage Test at Room Temp.	IS 10810(Pt-45)-1984 IS 1554-1&2-1988 IS 7098-1-1988 IS 7098-2-1985 IS 7098-3-1993 IS 694-1990 IS 14255-1995	Upto 120 kV
		Water Immersion Test (High Voltage)	IS 10810(Pt-45)-1984 IS 1554-1&2-1988 IS 694-1990	10 kV AC & 1.5 kV DC

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	HT Power Cable Upto 66 kV Grade A, LT Power Cable Upto 1.1 kV Grade, Control Cables Upto 1.1 kV Grade, Ariel Bunched Cable (Upto & Including 33kV)	Flammability Test	IS 10810(Pt-53)-1984	Upto 1000 mm
			IS 1554-1&2-1988	
			IS 7098-1-1988	
			IS 7098-2-1985	
	As per specification IS: 1554(1) - 1988 IS: 1554(2) - 1988 IS: 7098(1) - 1988 IS: 7098(2) – 1985 IS: 7098(3) - 1993 IS: 694 - 1990 IS: 14255 - 1995	Cold Bend Test	IS 7098-3-1993	Room Temperature to -40 °C
			IS 694-1990	
			IS 10810(Pt-20)-1984	
			IS 1554-1&2-1988	
			IS 7098-1-1988	
	As per specification IS: 1554(1) - 1988 IS: 1554(2) - 1988 IS: 7098(1) - 1988 IS: 7098(2) – 1985 IS: 7098(3) - 1993 IS: 694 - 1990 IS: 14255 - 1995	Cold Impact Test	IS 7098-2-1985	Room Temperature to -40 °C
			IS 7098-3-1993	
			IS 694-1990	
			IS 10810(Pt-21)-1984	
			IS 1554-1&2-1988	
			IS 7098-1-1988	
	As per specification IS: 1554(1) - 1988 IS: 1554(2) - 1988 IS: 7098(1) - 1988 IS: 7098(2) – 1985 IS: 7098(3) - 1993 IS: 694 - 1990 IS: 14255 - 1995	Hot Set Test For XLPE	IS 7098-2-1985	200 °C & 250 °C : 0.01 mm to 150 mm
			IS 7098-3-1993	
			IS 14255-1995	
			IS 10810(Pt-30)-1984	
			IS 7098-1-1988	
	As per specification IS: 1554(1) - 1988 IS: 1554(2) - 1988 IS: 7098(1) - 1988 IS: 7098(2) – 1985 IS: 7098(3) - 1993 IS: 694 - 1990 IS: 14255 - 1995	Water Absorption Test on XLPE (Gravimetric)	IS 7098-2-1985	Upto 100 °C , 0.00001 g to 180 gm
			IS 7098-3-1993	
			IS 14255-1995	
			IS 10810(Pt-33)-1984	
			IS 1554-1&2-1988	
			IS 7098-1-1988	

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	HT Power Cable Upto 66 kV Grade A, LT Power Cable Upto 1.1 kV Grade, Control Cables Upto 1.1 kV Grade, Ariel Bunched Cable (Upto & Including 33kV)	Partial Discharge Test	IS 10810(Pt-46)-1984 IS 7098 Part 2-1985 IS 7098 Part 3-1993 IS 1554 Part 2-1988	1 to 200 pC
		Bending Test	IS 10810(Pt-50)-1984 IS 7098 Part 2-1985 IS 7098 Part 3-1993 IS 1554 Part 2-1988	Mandrel Dia: 250 mm
	As per specification IS: 1554(1) - 1988 IS: 1554(2) - 1988 IS: 7098(1) - 1988 IS: 7098(2) – 1985 IS: 7098(3) - 1993 IS: 694 - 1990 IS: 14255 - 1995	Heating Cycle Test	IS 10810(Pt-49)-1984 IS 7098 Part 2-1985 IS 7098 Part 3-1993 IS 1554 Part 2-1988	Upto 100 °C
		Impulse Withstand Test	IS 10810(Pt-47)-2004 IS 7098 Part 2-1985 IS 7098 Part 3-1993 IS 1554 Part 2-1988	Upto 500 kV & Upto 110°C
		Dielectric Power Factor Test 1) As a fun. of voltage at U_0 Increment of ten delta b/n $0.5U_0$ & $2U_0$ 2) As a fun. of temp at 2kV At RT At 90°C	IS 10810(Pt-48)-1984 IS 7098 Part 2-1985 IS 7098 Part 3-1993 IS 1554 Part 2-1988	Tan Delta: 0.00001 to $1X 10^{-6}$
		Oxygen Index Test	ASTM-D-2863-95 IS:10810(Pt-58&64)1984	Upto 100% (L.O.I) & Upto 400°C
		Temperature Index Test	ASTM-D-2863-95 IS:10810(Pt-58&64)1984	Upto 100% (L.O.I) & Upto 400°C
		Smoke Density Test	ASTM-D-2843-77 IS:10810(Pt-63)-1984	Upto 100 %

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		HCL Acid Gas Generation Test	IEC-754-1-1994 IEC-754-2-1991 IS:10810(Pt-59)-1984	Upto 1000 °C
		Flammability Test (Flame Retardant Test)	IS 10810(Pt-61)-1984 SS-424-1475 Class F3	Upto 1000 mm & 0.01mm to 300 mm
		Longitudinal water tightness Test	IS: 7098-Part 3-1993 IEC 60502	0 to 3100 mm.

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