

Laboratory	Electrical Testing Laboratory, Technical Services Department, BHEL, Bhopal, Madhya Pradesh		
Accreditation Standard	ISO/IEC 17025: 2005		
Discipline	Electrical Testing	Issue Date	03.02.2015
Certificate Number	T-0160	Valid Until	02.02.2017
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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
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I. ELECTRICAL MATERIALS

1.	Kraft Paper/ Tissue Paper/ Creepe, Nomex	Electrical strength Thickness, Substance, Density, Water absorption, Moisture contents, Hill count	IEC 60554-2: 2001-11 IEC 60554-2: 2001-11 IEC 60554-2: 2001-11 IEC 60554-2: 2001-11 IEC 60554-2: 2001-11 IEC 60554-2: 2001-11 IEC 60554-3: 1980-01	1 kV to 5/ 20 kV 10 µm to 800 µm 20 g/m ² to 850 g/m ² 0.65 g/cc min. 0.5 mm to 150 mm 100 mg to 600 g 30 Hills/cm max
2.	Press Board & Press Paper	Electrical strength Moisture contents, Density, Shrinkage, Flexibility, Cohesion between plies	IS 1576: 1992 (R-2004) IEC 60641-2: 2004-06 IEC 60641-2: 2004-06 IEC 60641-2: 2004-06 IS 1576: 1992 (R-2004) IS 1576: 1992 (R-2004)	1 to 100 kV 100 mg to 600 g 0.65 g/cc min. 0.01mm to 300 mm Qualitative Qualitative
3.	Asbestos Cement Board	Electrical Strength	IS 4248: 1967 (R-2004)	1 kV to 100 kV
4.	Laminated Sheets and Mouldings (Phenolic, epoxy, Polyester, FRP, Polycarbonate, PTFE, Nylone)	Volume resistivity Surface resistivity Dissipation factor Comparative-tracking index Insulation Resistance Electrical Strength Water absorption	IS 1998: 1962 (R-2003) BS 903-C1: 1991(R-1996) BS 903-C2: 1982 (R-1995) IS 10192: 1982(R-2005) IS 2824: 1975 (R-2004) BS 2584: 1963 (R-2001) IEC 112: 2003-01 IS 11239-9: 1988 (R-2001)	1E06 Ω to 1E16 Ω 1E06 Ω to 1E16 Ω 0.0001 to 4.999 50 to 900 1E06 Ω to 1E16 Ω 1 kV to 100 kV 100 mg to 600 g
5.	Epoxide glass fabric tube, fibre glass epoxide tube, glass filament wound epoxy bonded tube, FBR rods and nuts	Electrical strength Comparative tracking index Water absorption	BS 2782-3: 1976 (R-1996) IS 1998: 1962 (R-2003) IS 2824: 1975 (R-2004) IEC 60112: 2003-01 IS 11239-9: 1988 (R-2001)	(1 to 100) kV AC 50 to 900 100 mg to 600 g

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6.	PVC sheet flexible	Electrical strength Volume resistivity	IS 2076: 1981 (R-2003) IS 3396: 1979 (R-2007) IS 2584: 1963 (R-2007) BS 903-C1: 1991 (R1996)	(1 to 100) kV AC 0E06 Ω to 1E16 Ω
7.	Sleeves	Electrical Strength	BS 2782-3: 1976 (R-1996)	1 kV to 100 kV
8.	Polyester film, PP film, Polyvinyl, Polyimide, adhesive/ non adhesive	Electrical strength Dissipation factor Volume resistivity Space factor Camber Water absorption Shrinkage Density Thickness	IS 2584: 1963 (R-2007) BS 2782-3: 1976 (R-1996) ASTM D 150: 1998(R2004) ASTM D 257: 1999(R2003)	(1 to 5/ 20) kV AC 0.0001 to 4.999 1E06 Ω to 1E16 Ω 4 to 20% 0.5 mm min 100 mg to 600 g 0.01 mm to 300 mm 0.5 g/cc min. 8.0 μ m to 25 mm
9.	PVC Adhesive/ Non Adhesive Tape	Electrical strength	IS 7809-2: 1977 (R-2007)	(1 to 5/ 20) kV AC
10.	PTFE Tape	Electrical strength Surface resistance	IS 7809-2: 1977 (R-2007) IS 7809-2: 1977 (R-2007)	(1 to 5/ 20) kV AC 1E06 Ω to 1E16 Ω
11.	Polyester Glass Mat Sheet	Electrical strength Insulation resistance Dissipation factor Comparative tracking index Water absorption	IS 2584: 1963 (R-2007)	(1 to 5/ 20) kV 1E06 Ω to 1E16 Ω 0.0001 to 4.999 50 to 900 100 mg to 600 g
12.	Seasoned Hardwood	Electrical strength	IS 1708-1: 1986 (R-2005) IS 3364-2: 1976 (R-2004)	(1 to 100) kV AC
13.	Natrium treated PTFE Tape	Electrical strength Surface resistivity	IS 7809-2: 1977 (R-2007)	(1 to 5/ 20) kV AC 1E06 Ω to 1E16 Ω

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14.	Insulating Oil, PXE	Electrical strength Tan delta (Dissipation factor) Resistivity Ageing characteristics	IS 335: 1993 (R-2005) IS 6103: 1971 (R-2006) IS 6792: 1992 (R-2003) IS 6262: 1971 (R-2006) IS 12177: 1987 (R-2003)	1 kV to 100 kV 0.0001 to 4.999 1E06 Ω to 1E16 Ω
15.	Magnetic sheet steel CRNGO, CRGO	Total specific Iron losses Surface Insulation resistivity AC magnetization Surface coating thickness Stacking factor Bend Test Ageing Test Adherence Test Anistrophy of losses	IEC 60404-2 & IEC 60404-3 IS 649: 1997 (R-2001) IS 648:2006 IS 3024:2006	0.001 T to 1.99 T (0 to 6443) Ω cm ² (2 to 10000) A/m(SST) (2 to 30000) A/m (Eps) 0 to 535 μ m 100 % max 1 min at 5 mm radius 0.001 T to 1.99 T Qualitative at 0.001 to 1.99 T
16.	Rubber, Cork Sheet	Electrical strength Surface resistivity Volume resistivity Insulation resistance Change in volume Flexibility Ageing characteristics	IS 3400-15: 1971 (R-2003) BS 903-C1: 1991 (R-1996) BS 903-C2: 1982 (R-1995) IS 4253-1: 1980 (R-2004) IS 4253-2: 1980 (R-2004)	(1 to 100) kV AC 1E06 Ω to 1E16 Ω 1E06 Ω to 1E16 Ω 1E06 Ω to 1E16 Ω 3 mm to 50 mm mandrel dia
17.	Moulding, Micanite	Electrical strength	IS 2464: 1963 (R-2004)	1 kV to 100 kV
18.	Mica Paper Tape and Sheet	Electrical strength Comparative tracking index Tan delta (Dissipation factor)	IEC 371-2: 2004-06 IS 2584: 1963 (R-2007) IS 2584: 1963 (R-2007)	(1 to 5/ 20) kV 50 to 900 0.0001 to 4.999

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19.	Glass and Polyimide Fibre Sheet	Electrical strength Water absorption Comparative tracking index	IS 5352-2: 1999 (R-2004) IS 11239-9: 1988 (R-2001) IS 2824: 1975 (R-2004)	1 kV to 100 kV 100 mg to 600 g 50 to 900
20.	Glass and Polyimide Tape	Electrical strength Volume resistivity	IS 2584: 1963 (R-2007) IS 2259: 1963 (R-2005)	1 kV to 100 kV 1E06 to 1E16
21.	Enameled and varnished glass covered round and rectangular copper conductor	Resistivity ($\mu\Omega\cdot\text{mm}^2/\text{m}$) Break down voltage	IS 613: 2000 (R-2006) IS 4685-1: 1968 (R-2005)	10 $\mu\Omega$ to 100 Ω 1 to 5/ 20 kV
22.	Polyester film mica, Kapton taped conductor	Resistivity ($\mu\Omega\cdot\text{mm}^2/\text{m}$) Break down voltage	IS 613: 2000 (R-2006) IEC 60317-1: 1997-12	10 $\mu\Omega$ to 100 Ω 1 to 5/ 20 kV
23.	Electrical Insulators	Electric strength	IS 2584: 1963 (R-2007)	1 kV to 100 kV
24.	Space Heaters	HV Test Wattage Insulation Resistance Leakage current	IS 302	(1 to 5/ 20) kV 10 W to 2000 W 1E06 to 1E16
25.	Paper covered conductor, flexible, round	Resistivity ($\mu\Omega\cdot\text{mm}^2/\text{m}$)	IS 613: 2000 (R-2006)	10 $\mu\Omega$ to 100 Ω
26.	Cables - Paper, Rubber, Silicone, PVC, PTFE, XLPE insulated	Conductor resistance Electrical strength/ BDV Insulation Resistance	IS 8130: 1984 (R-2006) IS 10810-5: 1996 (R-2006) IS 10810-43: 1996 (R-2006) IS 10810-45: 1996 (R-2006)	10 $\mu\Omega$ to 100 Ω 1 kV to 100 kV 1E06 to 1E16

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27.	Bare conductors, copper, Brass, Aluminum and alloys	Resistivity ($\mu\Omega \cdot \text{mm}^2 / \text{m}$) Conductivity	IS 613: 2000 (R-2006) IS 10810-5: 1996 (R-2006) IS 10810-7: 1996 (R-2006) ASTM B 193-2: 2002 ASTM E 1004-2: 2002	10 $\mu\Omega$ to 100 Ω
28.	RTD, BTD etc.	Insulation resistance HV test	IS 2848: 1986 (R-2006) IS 2584: 1963 (R-2007)	1E06 to 1E16 1 to 5/ 20 kV
29.	Carbon Brush	Milli Volt drop test	IS 13466: 1992 (R-2003)	100 A, 100 mV
30.	Harmonic analysis of Electrical machines	Harmonics	IS 4722: 2001(R-2006) IS 2026-1: 1977 (R-2006) IEC 6076-1: 2000-04	Upto 50 th harmonic in multiples of 50 Hz

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