

Laboratory **Central Electrical Testing Laboratory, Kakkalur, Tiruvallur District, Tamil Nadu**

Accreditation Standard **ISO/IEC 17025: 2005**

Certificate Number **TC-6558 (in lieu of T-0103)**

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Validity **24.09.2017 to 23.09.2019**

Last Amended on **15.11.2017**

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 AND ACCESSORIES				
1.	Power cables with Excluded insulation / XLPE insulated cable, PVC Insulated wires, control cables & power cables Automobiles cables, PVC Insulated (Heavy duty) Electric cables for working voltage upto and including 1100V	Materials	IS 694:2010 (RA 2015) Clause 4 to 8, IS 1554 (Part 1) : 1988 (RA 2010) Clause 3 to 7, IS 2465 : 1984 (RA 2016) Clause 3 to 5 & IS 7098 (Part 1):1988 (RA 2015) Clause 3 to 7	Qualitative
		Construction	IS 694:2010 (RA 2015) Clause 16 to 22, IS 1554 (Part 1) : 1988 (RA 2010) Clause 8 to 13, IS 2465 : 1984 (RA 2016) Clause 6 to 11, IS 7098(Part 1) : 1988 (RA 2015) Clause 8 to 14	0.16 mm to 18.0 mm
		Annealing	IS 10810 (Part 1) : 1984 (RA 2016)	10 mm to 300 mm 0.21 mm to 1.36 mm
		Tensile	IS 10810 (Part 2) : 1984 (RA 2016)	50 N to 2.5kN
		Wrapping	IS 10810 (Part 3) : 1984 (RA 2016)	Qualitative
		Persulphate (for tinned copper only)	IS 10810 (Part 4) : 1984 (RA 2016)	0.5 g to 2 g
		Resistance	IS 10810 (Part 5) : 1984 (RA 2016)	0.1 mΩ to 500 mΩ
		Overall dimension and	IS 10810 (Part 6) : 1984	0.1mm to 10 mm

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		thickness of insulation & sheath	(RA 2016)	
		Tensile strength & elongation at break	IS 10810 (Part 7) : 1984 (RA 2016)	50 N to 200 N 50 mm to 300 mm
		Loss of mass	IS 10810 (Part 10) : 1984 (RA 2016)	0.5 g to 2 g
		Ageing	IS 10810 (Part 11) : 1984 (RA 2016)	Ambt. to 200°C
		Shrinkage	IS 10810 (Part 12) : 1984 (RA 2016)	Ambt. to 200°C 180 mm to 200 mm
		Water absorption (gravimetric)	IS 10810 (Part 33) : 1984 (RA 2016)	Ambt. to 100°C 0.5 g to 2 g
		Heat shock	IS 10810 (Part 14) : 1984 (RA 2016)	Ambt. to 200°C
		Hot Deformation	IS 10810 (Part 15) : 1984 (RA 2016)	Ambt. to 150°C 0.1 mm to 10 mm
		Insulation Resistance	IS 10810 (Part 43) : 1984 (RA 2016)	500V DC 1.3 GΩ to 1000 GΩ
		High Voltage	IS 10810 (Part 45) : 1984 (RA 2016)	1 kv to 7.5 kV AC
		Flammability	IS 10810 (Part 53) : 1984 (RA 2016)	0.3 mm to 1000 mm 0.6 sec to 80 sec
		Cold Bend	IS 10810 (Part 20) : 1984 (RA 2016)	(-) 5° C to (-) 15° C
		Cold Impact	IS 10810 (Part 21) : 1984 (RA 2016)	(-)5 °C to (-)15 °C
		Additional ageing	IS 694:2010 (RA 2015) Clause 10. 9	Ambt. to 100°C 1 kV to 7.5 kV AC
		Effect of Lubricating oil, brake fluid, Diesel and Petrol	IS 2465 : 1984 (RA 2016) Clause 20	Ambt. to 200°C 2.5 mm to 25 mm
		Identification Packing & Marking	IS 694:2010 (RA 2015) Clause 13&15, IS 1554 (Part 1) : 1988 (RA 2010)	Qualitative

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			Clause 17 & 18 IS 2465 : 1984 (RA 2016) Clause 23 & 24	
		Round steel wire/ formed steel wire (strip) armour dimensions	IS 10810 (Part 36) : 1984 (RA 2016)	0.1 mm to 10 mm 0.1 mm to 10 mm
		Tensile strength & elongation at break	IS 10810 (Part 37) : 1984 (RA 2016)	20.0 N to 2.5 kN 0.7 mm to 300 mm
		Torsion test for round wire	IS 10810 (Part 38) : 1984 (RA 2016)	15 turns to 67 turns
		Resistivity	IS 10810 (Part 42) : 1984 (RA 2016)	0.1 mΩ to 500 mΩ
		Winding test for formed wires	IS 10810 (Part 39) : 1984 (RA 2016)	Qualitative
		Mass of zinc coating	IS 10810 (Part 41) : 1984 (RA 2016)	0.07 g to 125 g
		Uniformity of zinc coating	IS 10810 (Part 40) : 1984 (RA 2016)	0.07 g to 125 g
		Hot set	IS 10810 (Part 30) : 1984 (RA 2016)	Ambt. to 200°C 20 mm to 50 mm
		Thermal stability	IS 10810 (Part 60) : 1988 (RA 2015)	Ambt. to 200 °C
II.	LAMPS, LUMINARIES AND ACCESSORIES			
1.	Tungsten filament general service electric lamps, High Pressure Mercury Vapour Lamps,	Construction	IS 1534 (Part1) : 1977 (RA 2011) Clause 3 IS 15885 (Part1) : 2011 (RA 2016) Clause 15	Qualitative
		Marking	IS1534 (Part 1) : 1977 (RA 2011) Clause 8, IS 15882 : 2009 Clause 5	Qualitative

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	High Pressure Sodium Vapour Lamps, Tubular fluorescent Lamps, Starters for Fluorescent Lamps, Ballast for Fluorescent Lamps (For Switch start circuits), Self ballasted lamps, Ballasts For Discharge Lamps (Excluding Tubular Fluorescent Lamps) Performance Requirements, Incandescent lamps (Tungsten filament lamps for domestic and similar general lighting purpose)	Visual Examination	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.4	Qualitative
		Terminals for External Wiring	IS1534 (Part 1) : 1977 (RA 2011) Clause 4	Up to 25 mm
		Screws, Current Carrying Parts & Connections	IS 15885 (Part 1) : 2011 (RA 2016) Clause 17 IS1534 (Part 1) : 1977 (RA 2011) Clause 5	Upto 150 mm Upto 1.2 Nm
		Provision for Earthing	IS1534 (Part 1) : 1977 (RA 2011) Clause 6, IS 15885 (Part 1) : 2011 (RA 2016) Clause 9	Upto 150 mm Upto 1.2 Nm
		Creepage distances & Clearances	IS1534 (Part 1) : 1977 (RA 2011) Clause 7, IS 15885 (Part 1) : 2011 (RA 2016) Clause 16	Upto 150 mm
		Protection against accidental contact and electric shock	IS 15885 (Part 1) : 2011 (RA 2016) Clause 10, IS1534 (Part 1) : 1977 (RA 2011) Clause 9.5	Upto 750Vp Upto 60 min
		Voltage across Capacitor	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.6	Upto 300 V AC
		Moisture Resistance and Insulation	IS 15885 (Part 1) : 2011 (RA 2016) Clause 11, IS1534 (Part 1) : 1977 (RA 2011) Clause 9.7	10°C to 100°C, 20 % RH to 95 % RH Upto 5 kV AC, Upto 1000 MΩ, 1480V AC 500V DC
		Short-circuit Current	IS15882 : 2009 Clause 15.2	Upto 10A
		Open-circuit voltage	IS15882 : 2009 Clause 15.3	Upto 750V

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		Provision for earthing	IS 15885 (Part 1) : 2011 (RA 2016) Clause 9	12 V, 25 A
		Limitation of Ballast Heating	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.9, IS 15885 (Part 2/Section9) : 2011 (RA 2015) Clause 14	Upto 300 V 5 KV AC 300°C 300Ω 1000W 10A
		Ballast setting	IS15882 : 2009 Clause 15.1	Upto 300V Upto 10A Upto 400W
		Mechanical Strength	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.10	Upto 0.4 Nm
		High voltage impulse testing	IS 15885 (Part 2/Section 9) : 2011 (RA 2015) Clause 15	Upto 4.5 kV
		Resistance to corrosion & brittleness	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.12, IS 15885 (Part 1) : 2011 (RA 2016) Clause 19	Qualitative
		Resistance to Heat	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.11	Ambient to 200 °C Upto 25 mm
		Resistance to heat, fire & tracking	IS 11000 (Part 2/Section1) : 2008 (RA 2016), 15885 (Part 1) : 2011 (RA 2016) Clause 18	Amb. to 200°C Upto 25 mm Amb. to 999°C Upto 99.9 sec
		Testing of Performance	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.13	Upto 300 V 10 A Upto 750 V Peak UPF
		Ballast losses	IS1534 (Part 1) : 1977 (RA 2011) Clause 9.14	Upto 300 V Upto 1000 W

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				Upto 10A Upto 300 Ω
		Circuit Power factor	IS15882 : 2009 Clause 7	Upto UPF
		Supply Current	IS15882 : 2009 Clause 8	Upto 5 A
		Current Wave form I) Supply Current wave form II) Lamp operating current wave form	IS15882 : 2009 Clause 9	Upto 750Vp Upto 300V
		Magnetic screening	IS15882 : 2009 Clause 10	Qualitative
		Marking	IS 2215 : 2006 (RA 2015) Clause 6	Qualitative
		Protection against electric shock	IS 2215 : 2006 (RA 2015) Clause 7.3	Qualitative
		General Requirements	IS 2215 : 2006 (RA 2015) Clause 4	Qualitative
		Dimensional Checking	IS 2215 : 2006 (RA 2015) Clause 7.6	Upto 150 mm
		Insulation Resistance under Humidity conditions	IS 2215 : 2006 (RA 2015) Clause 7.4	10 °C to 100 °C 20 % RH to 95 % RH Upto 5 kV AC 500 V DC 1000 M Ω
		Connection	IS 2215 : 2006 (RA 2015) Clause 7.9	
		High Voltage	IS 2215 : 2006 (RA 2015) Clause 7.5	Upto 5 kV AC
		Torsion	IS 2215 : 2006 (RA 2015) Clause 7.7	Upto 5 Nm
		Mechanical Strength	IS 2215 : 2006 (RA 2015) Clause 7.8	Qualitative
		Resistance to heat &	IS 2215 : 2006 (RA 2015)	Ambient to 200 °C

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		fire	Clause 7.10 IS 11000 (Part 2/Section1) : 2008 (RA 2016)	Upto 25 mm Ambient to 999°C Digital Timer 0 to 99.9 s Upto 9999.9 hrs
		Quality of marking	IS 2215 : 2006 (RA 2015) Clause 7.11	Qualitative
		Starting	IS 2215 : 2006 (RA 2015) Clause 8	Upto 25 sec Upto 300V Upto 30 minutes
		Endurance	IS 2215 : 2006 (RA 2015) Clause 9	Upto 300V 15/30/60 sec Upto 999999 Upto 25 sec Upto 30 min Upto 750Vp
		De-activated lamp	IS 2215 : 2006 (RA 2015) Clause 10	Upto 9999.9 Hrs Upto 300V Upto 25 secs Upto 30 minutes.
		Radio interference Suppression Capacitors	IS 2215 : 2006 (RA 2015) Clause 7.12	Upto 30 µF, 10 °C to 100 °C, RH : 20 % to 95 %, Upto 5 kV AC & DC Upto 300 V Upto 60 minute
		Heating of Starters with operating time limitation	IS 2215 : 2006 (RA 2015) Clause 7.13	Ambient to 300 °C Upto 9999.9 Hrs Up to 300V
		General	IS 418:2004 RA (2009) Clause 5, IS 9974 (Part 1) : 1981 (RA 2017) Clause 3	Qualitative
		Mechanical, Physical &	IS 9900 (Part 1) : 1981	Upto 5 Nm

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		Starting Requirements	(RA 2017) Clause 4, IS:2418 (Part 1) : 1977 (RA 2010) Clause 4 & 6.4, IS 9974 (Part 1) : 1981 (RA 2017) Clause 4	500V DC Upto 1000MΩ Upto1000 mm Upto 9° Upto 150 mm
		Lamp Dimensions	IS 9900 (Part 1) : 1981 (RA 2017) Clause 4.1.3, IS 418 : 2004 (RA 2009) Clause 7, IS 15111 (Part 2) : 2002 (RA 2017) Clause 6	Upto 1000 mm Upto 150mm
		Marking	IS 418 : 2004 (RA 2009) Clause 6, IS 15111 (Part 2) : 2002 (RA 2017) Clause 18.1, IS 2418 (Part 1) : 1977 (RA 2010) Clause 5, IS 15518 (Part 1) : 2004 (RA 2009) Clause 4.2 IS 9900 (Part 1) : 1981 (RA 2017) Clause 6 IS 9974 (Part 1) : 1981 (RA 2017) Clause 5 IS 15111 (Part 1) : 2002 (RA 2017) Clause 6	Qualitative
		Visual Examination	IS 2418 (Part1) : 1977 (RA 2010) Clause 6.3	Qualitative
		Interchangeability	IS 15111 (Part 1) : 2002 (RA 2017) Clause 7, IS 15518 (Part 1) : 2004 (RA 2009) Clause 4.10	Upto 150 mm

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		Burning	IS 2418 (Part1) : 1977 (RA 2010) Clause 6.6	Upto 300V Upto 30 min
		Electrical Luminous and Colour Characteristics	IS 2418 (Part1) : 1977 (RA 2010) Clause 6.8	Upto 300V 10A Upto 30 min Upto 199990 Lumens X : 0.313, Y : 0.337 Upto 1000W
		Protection against electric shock	IS 15111 (Part 1) : 2002 (RA 2017) Clause 8	Qualitative
		Protection against accidental contact	15518 (Part 1) : 2004 (RA 2009) Clause 4.3	Upto 150 mm
		Insulation resistance	15518 (Part 1) : 2004 (RA 2009) Clause 4.6 IS:2418 (Part1) : 1977 (RA 2010) Clause 6.5	500V DC Upto 1000MΩ
		Insulation resistance and electric strength after humidity treatment	IS 15111 (Part 1) : 2002 (RA 2017) Clause 9	10 to100°C 20 %RH to 95% RH Upto 5kV AC 500VDC Upto 1000MΩ
		Creepage Distance	15518 (Part 1) : 2004 (RA 2009) Clause 4.8	Upto 150 mm
		Starting & Warm-up Characteristics	IS 2418 (Part 1) : 1977 (RA 2010) Clause 6.7, IS 9900 (Part 1) : 1981 (RA 2017) Clause 4.2, IS 9974 (Part 1) : 1981 (RA 2017) Clause 7	Upto 9999.9 hr Upto 300V Upto 30 minute Upto 10A
		Ageing	IS 418 : 2004 (RA 2009) Annex A-2, IS 9900 (Part 1) : 1981 (RA 2017) Clause 7.2, IS 9974	Upto 9999.9 hr Upto 300V

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			(Part 1) : 1981 (RA 2017) Clause 7.4.1, IS 2418 (Part 1) : 1977 (RA 2010) Clause 6.2.2	
		Lamp Wattage	IS 418 : 2004 (RA 2009) Clause 8.1, IS 15111 (Part 2) : 2002 (RA 2017) Clause 9	Upto 1000W
		Lamp electrical characteristics	IS 9900 (Part 1) : 1981(RA 2017) Clause 7 IS 9974 (Part 1) : 1981 (RA 2017) Clause 7.4	Upto 300V, Upto 10A, Upto 1000W, Upto 199990 lumens Upto 30 min.
		Luminous flux	IS 418 : 2004 (RA 2009) Clause 8.2, IS 9900 (Part 1) : 1981 (RA 2017) Clause 7.4, IS 15111 (Part 2) : 2002 (RA 2017) Clause 10	Upto 199990 lumens
		Mechanical strength	IS 15111(Part 1) : 2002 (RA 2017) Clause 10	Upto 5 Nm
		Red Ratio (Fluorescent coated lamps)	IS 9900 (Part 1) : 1981 (RA 2017) Clause 7.5	Qualitative
		Lamp Warm-up current	IS 9974 (Part 1) : 1981 (RA 2017) Clause 8.3	Upto 30 min Upto 300V Upto 10A
		Current crest factor	IS 9974 (Part 1) : 1981 (RA 2017) Clause 8.4	Upto 300V, Upto 4000mV
		Lamp stability with rapidly reduced supply voltage	IS 9900 (Part 1) : 1981 (RA 2017) Clause 7.6	Upto 30 min Upto 300V
		Torsion	IS 2418 (Part 1) : 1977 (RA 2010) Clause 6.4,	Qualitative

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			IS 9900 (Part 1) : 1981 (RA 2017) A-1	
		Cap Temperature rise	IS 8913 : 1978 (RA 2017)	Upto 300V Upto 800°C
		Resistance to Torque	15518 (Part 1) : 2004 (RA 2009) Clause 4.5	Upto 5 Nm
		Resistance to heat	IS 15111 (Part 1) : 2002 (RA 2017) Clause 12	Amb. to 200°C Upto 25 mm
		Resistance to flame and ignition	IS 15111 (Part 1) : 2002 (RA 2017) Clause 13	Amb. to 999°C Upto 99.9sec
		Fault conditions	IS 15111 (Part 1) : 2002 (RA 2017) Clause 14	Upto 300V, 2 MΩ to 100 GΩ Upto 1000 V DC Upto 9999.9 hr
		Starting and run-up	IS 15111 (Part 2) : 2002 (RA 2017) Clause 8	Upto 300V, Upto 30 min Upto 199990 lumens
		Colour	IS 15111 (Part 2) : 2002 (RA 2017) Clause 11	Upto 300V, Upto 10A Upto 30 min x : 0.313, Y : 0.337
		Lumen maintenance	IS 418 : 2004 (RA 2009) Clause 9, IS 15111 (Part 2) : 2002 (RA 2017) Clause 12, IS 2418 (Part 1) : 1977 (RA 2010) Clause 7.4	Upto 300V, Upto 9999.9 Hrs. Upto 199990 lumens Up to 30 min.
		Harmonics	IS 15111 (Part 2) : 2002 (RA 2017) Clause 14	Upto 50th order
		Lamp efficacy	IS 15111 (Part 2) : 2002 (RA 2017) Clause 15	Upto 300V, Upto 10 A
		Power factor	IS 15111 (Part 2) : 2002 (RA 2017) Clause 16	Upto UPF

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		Life performance	IS 418 : 2004 (RA 2009) Clause 10, IS 2418 (Part 1) : 1977 (RA 2010) Clause 6.9, IS 9900 (Part 1) : 1981 (RA 2017) Clause 8, IS 9974 (Part 1) : 1981 (RA 2017) Clause 10, IS 15111(Part 2) : 2002 (RA 2017) Clause 13	Upto 300V Upto 9999.9 hrs. Upto 99999.9 kV ² h Upto 5 Nm
III.	WIRING ACCESSORIES			
1.	Ceiling Roses, Plugs and Socket outlets, Switches for domestic and similar purposes	Rating	IS 1293:2005 (RA 2010) Clause 6, IS 3854 : 1997 (RA 2017) Clause 6, IS 371:1999 (RA 2010) Clause 7	Qualitative
		Marking	IS 1293:2005 (RA 2010) Clause 8, IS 3854 : 1997 (RA 2017) Clause 8 IS 371:1999 (RA 2010) Clause 9	Qualitative
		Dimensional Check	IS 371:1999 (RA 2010) Clause 10, IS 1293:2005 (RA 2010) Clause 9, IS 3854 : 1997 (RA 2017) Clause 9	1 mm to 100 mm
		Protection against electric shock	IS 1293:2005 (RA 2010) Clause 10, IS 3854 : 1997 (RA 2017) Clause 10	75 N & 150 N 1 min. to 15 min
		Accessibility of live parts	IS 371:1999 (RA 2010) Clause 11	5 N, 0.1 to 0.5Nm

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		Provision for earthing	IS 1293:2005 (RA 2010) Clause 11, IS 3854 : 1997 (RA 2017) Clause 11, IS 371:1999 (RA 2010) Clause 12	12V, 25A 50 mV to 2.5V
		Terminals	IS 1293:2005 (RA 2010) Clause 12, IS 3854 : 1997 (RA 2017) Clause 12, IS 371:1999 (RA 2010) Clause 13	0.2Nm to 3 Nm 1 mm to 6 mm 15 mV to 25 mV 30 sec. to 30 min. 1.05 A to 20A
		Constructional requirements	IS 3854 : 1997 (RA 2017) Clause 13, IS 1293:2005 (RA 2010) Clause 13 & 14 IS 371:1999 (RA 2010) Clause 14	5 N to 100N 1 min to 120 min 1 mm to 8 mm Ambt. to100° C 0.2 Nm to 3 Nm
		Mechanism	IS 3854 : 1997 (RA 2017) Clause 14	Qualitative
		Interlock verification	IS 1293:2005 (RA 2010) Clause 15	
		Resistance to Ageing, to harmful ingress of Water and to humidity	IS 3854 : 1997 (RA 2017) Clause 15, IS 1293:2005 (RA 2010) Clause 16	Ambt. to100°C 10 °C to 40°C RH 45 to 95% 5 N, IP 66
		Resistance to Moisture and to humidity	IS 371:1999 (RA 2010) Clause 15.1, 15.2 & 15.3	10 °C to 40°C RH 45 % to 95% 25 gm to 125 gm
		Insulation Resistance and Electric Strength	IS 371:1999 (RA 2010) Clause 15.5 & 15.6, IS 3854 : 1997 (RA 2017) Clause 16, IS 1293:2005 (RA 2010) Clause 17	500 V DC 1 MΩ to 100 MΩ 1 kV to 2 kV, AC 1 s. to 10 minutes

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		Operation of earthing contacts	IS 1293:2005 (RA 2010) Clause 18	Qualitative
		Temperature Rise	IS 371:1999 (RA 2010) Clause 16, IS 3854 : 1997 (RA 2017) Clause 17, IS 1293:2005 (RA 2010) Clause 19	Ambt. to 100°C 1.05 A to 50A
		Making & Breaking capacity	IS 3854 : 1997 (RA 2017) Clause 18, IS 1293:2005 (RA 2010) Clause 20	1 V to 300 V, 1A to 50 A, 0.1 to UPF 1 Sec. to 10 min
		Normal Operation	IS 3854 : 1997 (RA 2017) Clause 19, IS 1293:2005 (RA 2010) Clause 21	1 V to 300 V, 1A to 50 A, 0.1 to UPF
		Mechanical Strength	IS 371:1999 (RA 2010) Clause 17, IS 3854 : 1997 (RA 2017) Clause 20, IS 1293:2005 (RA 2010) Clause 24	Qualitative
		Force necessary to withdraw the plug	IS 1293:2005 (RA 2010) Clause 22	1 N to 55 N
		Flexible cables and their connection	IS 1293:2005 (RA 2010) Clause 23	10 N to 60 N 10 mm to 20 mm 20 mm to 1000 mm 1mΩ to 50 mΩ
		Resistance to Heat	IS 3854 : 1997 (RA 2017) Clause 21, IS 1293:2005 (RA 2010) Clause 25, IS 371:1999 (RA 2010) Clause 18	Ambt. to 125°C 0.1 mm to 4 mm 5 N to 20 N
		Screws, Current carrying parts & connections	IS 371:1999 (RA 2010) Clause 20, IS 3854 : 1997 (RA 2017)	0.2 Nm to 3Nm 1 mm to 6mm

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			Clause 22, IS 1293:2005 (RA 2010) Clause 26	
		Creepage distances & Clearances	IS 371:1999 (RA 2010) Clause 21, IS 3854 : 1997 (RA 2017) Clause 23, IS 1293:2005 (RA 2010) Clause 27	1 mm to 50 mm
		Resistance of insulating material to Abnormal Heat, to fire and to tracking	IS 371:1999 (RA 2010) Clause 19, IS 3854 : 1997 (RA 2017) Clause 24, IS 1293:2005 (RA 2010) Clause 28	Ambt. to 999°C, 1.3 sec to 30 sec
		Resistance to Rusting	IS 3854 : 1997 (RA 2017) Clause 25, IS 1293:2005 (RA 2010) Clause 29, IS 371:1999 (RA 2010) Clause 22	Ambt. to 100°C 10°C to 40°C RH 45 to 95%
		Additional tests on pins provided with insulating sleeves	IS 1293:2005 (RA 2010) Clause 30	Ambt. to 200°C 0.1 mm to 10 mm 10 °C to 60°C 90% RH to 95% RH (-) 15°C 2.5 N 0.01 hrs to 9 hrs 500V DC 1 MΩ to 100MΩ 1 kV to 2 kV AC
2.	Conduits for Electrical Installations, Conduits made of Insulating Material	Marking	IS 9537 (Part 3) : 1983 (RA 2017) Clause 6	Qualitative
Dimensions & Construction		IS 9537 (Part 3) : 1983 (RA 2017) Clause 7 & 8	1 mm to 100mm 1 mm to 35 mm	
Bending		IS 9537 (Part 3) : 1983 (RA 2017) Clause 9.2	Ambt. to -5°C 500 mm to 1000mm	

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		Compression	IS 9537 (Part 1) : 1983 (RA 2017) Clause 9.3	320 N to 1250kN 100 mm to 300 mm
		Impact	IS 9537 (Part 1) : 1983 (RA 2017) Clause 9.4	Ambt. to 100 °C Ambt. to -5°C 5gm to 2 kg 100 mm to 300 mm
		Collapse	IS 9537 (Part 1) : 1983 (RA 2017) Clause 9.5	Ambt. to 100 °C 340 mm to 1000mm
		Resistance to Heat	IS 9537 (Part 3) : 1983 (RA 2017) Clause 10	1 mm to 100mm Ambt. to 200 °C 0.1 mm to 5 mm
		Resistance to burning	IS 9537 (Part 1) : 1983 (RA 2017) Clause 11	50mm to 700mm 1 Sec. to 2 minutes
		Electrical Characteristics	IS 9537 (Part 1) : 1983 (RA 2017) Clause 12	1 kV to 7.5kV, AC 1.3GΩ to 1000 GΩ 500V to 1000 V DC
IV.	DOMESTIC ELECTRICAL APPLIANCES			

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1.	Electric iron, Domestic Electric food mixer (Liquidizers and grinders) and Centrifugal juicers, Electric Steam cookers, Electric Immersion water heaters, Stationary storage type electric water heaters, Electric instantaneous water heaters, Thermostats for use with electric water heaters, Mineral filled sheathed heating element, Mains operated electric Hair dryers, Mica Insulated heating element Self contained drinking water coolers, Table type Fans and Regulators, Ceiling type Fans and regulators, Railway carriage fans	Protection against electric shock	IS 302 (Part 2/Section 201) : 2008, Clause 8 IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 8, IS 4159 : 2002 (RA 2012) Clause 8, IS 6446 : 1986 (RA 2015) Clause 8, IS 3017 : 1985 (RA 2011) Clause 8, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 8, IS 302 (Part 2/Section 21) : 2011 Clause 8, IS 302 (Part 2/Section 35) : 1993 Clause 8, IS 302 (Part 2/Section 35) : 2011 Clause 8	Qualitative
		Input & Current	IS 302 (Part 2/Section 201) : 2008 Clause 10, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 10, IS 4159 : 2002 (RA 2012) Clause 10, IS 6446 : 1986 (RA 2015) Clause 10, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 10, IS 302 (Part 2/Section 21) : 2011 Clause 10, IS 302 (Part 2/Section 35) : 1993 Clause 10, IS 302 (Part 2/Section 35) : 2011 Clause 10	Upto 7200W

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		Temperature Rise	IS 302 (Part 2/Section 201) : 2008, Clause 11, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause11, IS 4159 : 2002 (RA 2012) Clause 11, IS 6446 : 1986 (RA 2015) Clause11, IS 3017 : 1985 (RA 2011) Clause 11, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 11, IS 302 (Part 2/Section 21) : 2011 Clause 11, IS 302 (Part 2/Section 35) : 1993 Clause 11, IS 302 (Part 2/Section35) : 2011 Clause 11	0.01Sec to 9.99 hour Upto 480 V, Upto 800°C
		Operation under Overload Condition	IS 368 : 2014 Clause 12 IS 4159 : 2002 (RA 2012) Clause 12, IS 6446 : 1986 (RA 2015) Clause12, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 12, IS 302 (Part 2/Section 35) : 1993 Clause 12, IS 3017 : 1985 (RA 2011) Clause 102, IS 302 (Part 2/Section35) : 2011, Clause 12	Upto 480 V Upto 800°C

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		Electrical insulation and Leakage current at Operating Temperature	IS 302 (Part 2/Section 201) : 2008, Clause 13, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause13, IS 4159 : 2002 (RA 2012) Clause 13, IS 6446 : 1986 (RA 2015) Clause13, IS 3017 : 1985 (RA 2011) Clause 13, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 13, IS 302 (Part 2/Section 21) : 2011 Clause 13, IS 302 (Part 2/Section 35) : 1993 Clause 13, IS 302 (Part 2/Section35) : 2011 Clause13	Upto 3000µA Upto 5kV AC 0.01Sec to 9.99hour
		Transient Overvoltage	IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause14, IS 302 (Part 2/Section 201) : 2008, Clause 14, IS 302 (Part 2/Section 21) : 2011 Clause 14, IS 302 (Part 2/Section35) : 2011 Clause 14	0.2 to 10 kV, Charging time =10 sec. Impulse rise time / duration = 1.2 / 50 µ sec
		Moisture Resistance	IS 302 (Part 2/Section 201) : 2008 Clause 15.2 & 15.3, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 15.2 & 15.3, IS 302 (Part 2/Section 21) : 2011 Clause 15.2 & 15.3, IS 302 (Part 2/Section35) : 2011 Clause 15.2 & 15.3,	10°C-100°C RH 20 % to 95% Upto 3000mA 0.01Sec to 9.99hours Upto 5 k AC

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			IS 4159 : 2002 (RA 2012) Clause 15, IS 6446 : 1986 (RA 2015) Clause 15, IS 3017 : 1985 (RA 2011) Clause 15, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 15, IS 302 (Part 2/Section 35) : 1993 Clause 15	
		Insulation Resistance and Electric Strength (After Humidity Treatment)	IS 302 (Part 2/Section 201) : 2008, Clause 16 IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 16, IS 4159 : 2002 (RA 2012) Clause 16, IS 6446 : 1986 (RA 2015) Clause 16, IS 3017 : 1985 (RA 2011) Clause 16, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 15, IS 302 (Part 2/Section 21) : 2011 Clause 16, IS 302 (Part 2/Section 35) : 1993 Clause 16, IS 302 (Part 2/Section 35) : 2011 Clause 16	500V DC Upto 3000µA 0.01Sec to 9.99hours Upto 5 kV AC
		Overload Protection	IS 302 (Part 2/Section 21) : 2011 Clause 17, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 17 IS 302 (Part 2/Section 21) : 1992 Clause 17 302 (Part 2/Section 35) : 1993 Clause 17,	Qualitative

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			IS 302 (Part 2/Section 201) : 2008, Clause 17, IS 302 (Part 2/Section 35) : 2011 Clause 17	
		Endurance	IS 8978:1992 (RA 2009), Clause12, IS 368:2014 Clause 18, IS 4159 : 2002 (RA 2012) Clause 18, IS 6446 : 1986 (RA 2015) Clause18, IS 3017 : 1985 (RA 2011) Clause 18, IS 11879:1986 (RA 2011) Clause18,IS 2082 : 1993 (RA 2009) Clause 23, IS 302 (Part 2/Section 35) : 2011, Clause 23	Upto 480V Upto 7200W
		Abnormal Operation	IS 302 (Part 2/Section 201) : 2008 Clause 19, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 19, IS 4159 : 2002 (RA 2012) Clause 19, IS 6446 : 1986 (RA 2015) Clause 19, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 19, IS 302 (Part 2/Section 21) : 2011 Clause 19, IS 302 (Part 2/Section 35) : 1993 Clause 19,IS 302 (Part 2/Section 35) : 2011 Clause 19	Upto 480V Upto 150°C Upto 3750 V AC
		Stability and Mechanical	IS 302 (Part 2/Section 201)	Upto 15°

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		Hazards	: 2008 Clause 20, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 20, IS 4159 : 2002 (RA 2012) Clause 20, IS 6446 : 1986 (RA 2015) Clause 20, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 20, IS 302 (Part 2/Section 21) : 2011 Clause 20, IS 302 (Part 2/Section 35) : 1993 Clause 20, IS 302 (Part 2/Section 35) : 2011 Clause 20	
		Mechanical Strength	IS 4159 : 2002 (RA 2012) Clause 21, IS 6446 : 1986 (RA 2015) Clause 21, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 21, IS 302 (Part 2/Section 35) : 1993 Clause 21, IS 302 (Part 2/Section 201) : 2008, Clause 21, IS 302 (Part 2/Section 35) : 2011 Clause 21, IS 3017 : 1985 Clause 21	Upto 2 N Upto 350mm
		Construction	IS 302 (Part 2/Section 201) : 2008, Clause 22 IS 302 (Part 2/Section 3) : 2007	Upto 100°C Upto 150 mm Upto 480 V Upto 1000mm

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			(RA 2017) Clause 22, IS 4159 : 2002 (RA 2012) Clause 22, IS 6446 : 1986 (RA 2015) Clause22, IS 3017 : 1985 (RA 2011) Clause 22, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 22, IS 302 (Part 2/Section 21) : 2011 Clause 22, IS 302 (Part 2/Section 35) : 1993 Clause 22, IS 302 (Part 2/Section 35) : 2011 Clause 22	-1 bar to 30 bar 0.01 sec to 9.99 hours
		Internal Wiring	IS 302 (Part 2/Section 201) : 2008 Clause 23, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 23, IS 4159 : 2002 (RA 2012) Clause 23, IS 6446 : 1986 (RA 2015) Clause23, IS 3017 : 1985 (RA 2011) Clause 23, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 23, IS 302 (Part 2/Section 21) : 2011 Clause 23, IS 302 (Part 2/Section 35) : 1993 Clause 23, IS 302 (Part 2/Section35) : 2011 Clause 23	Upto 5kV AC Upto 15 min
		Components	IS 302 (Part 2/Section 201)	Upto 480 V

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N. Venkateswaran
Program Director

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			: 2008 Clause 24, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 24, IS 4159 : 2002 (RA 2012) Clause 24, IS 6446 : 1986 (RA 2015) Clause24, IS 3017 : 1985 (RA 2011) Clause 24, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 24, IS 302 (Part 2/Section 21) : 2011 Clause 24, IS 302 (Part 2/Section 35) : 1993 Clause 24, IS 302 (Part 2/Section 35) : 2011 Clause 24	Upto 100°C -1 bar to 30 bar
		Supply connection & External Flexible Cable and Cords	IS 302 (Part 2/Section 201) : 2008 Clause 25, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 25, [60/min Flexing Test only], IS 4159 : 2002 (RA 2012) Clause 25, IS 6446 : 1986 (RA 2015) Clause25, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 25, IS 302 (Part 2/Section 21) : 2011 Clause 25, IS 302 (Part 2/Section 35) : 1993 Clause 25, IS 302	Upto 150 mm Upto 1000mm 2 gm to 30 Kg. 0.01sec to 9.99 hours

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			(Part 2/Section 35) : 2011 Clause 25	
		Terminals and External Conductors	IS 302 (Part 2/Section 201) : 2008 Clause 26, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 26, IS 4159 : 2002 (RA 2012) Clause 26, IS 6446 : 1986 (RA 2015) Clause 26, IS 3017 : 1985 (RA 2011) Clause 26, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 26, IS 302 (Part 2/Section 21) : 2011 Clause 26, IS 302 (Part 2/Section 35) : 1993 Clause 26, IS 302 (Part 2/Section 35) : 2011 Clause 26	Upto 150 mm
		Provision for Earthing	IS 302 (Part 2/Section 201) : 2008 Clause 27, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 27, IS 4159 : 2002 (RA 2012) Clause 27, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 27, IS 302 (Part 2/Section 21) : 2011 Clause 27, IS 302 (Part 2/Section 35) : 1993 Clause 27, IS 302	Upto 30 A, 12 V Upto 3 V

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			(Part 2/Section 35) : 2011 Clause 27	
		Screws and Connections	IS 302 (Part 2/Section 201) : 2008 Clause 28, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 28, IS 4159 : 2002 (RA 2012) Clause 28, IS 3017 : 1985 (RA 2011) Clause 28, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 28, IS 302 (Part 2/Section 21) : 2011 Clause 28, IS 302 (Part 2/Section 35) : 1993 Clause 28, IS 302 (Part 2/Section 35) : 2011 Clause 28	Upto 6.0 Nm 0.1 to 1.2Nm Upto 25mm
		Creepage distance and Clearance	IS 302 (Part 2/Section 201) : 2008 Clause 29, IS 302 (Part 2/Section 21) : 2011 Clause 29, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 29, [Clearance Test only] IS 4159 : 2002 (RA 2012) Clause 29, IS 6446 : 1986 (RA 2015) Clause 29, IS 3017 : 1985 (RA 2011) Clause 29, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 29, IS 302	Upto 150 mm

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			(Part 2/Section 21) : 2011 Clause 29, IS 302 (Part 2/Section 35) : 1993 Clause 29, IS 302 (Part 2/Section 35) : 2011 Clause 29	
		Resistance to Heat, Fire and Tracking	IS 302 (Part 2/Section 201) : 2008 Clause 30, IS 302 (Part 2/Section 21) : 2011 Clause 30, IS 302 (Part 2/Section 3) : 2007 (RA 2017) Clause 30 [Heat& fire test only] IS 4159 : 2002 (RA 2012) Clause 30, IS 6446 : 1986 (RA 2015) Clause 30, IS 3017 : 1985 (RA 2011) Clause 30, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 30, IS 302 (Part 2/Section 35) : 1993 Clause 30, IS 302 (Part 2/Section 35) : 2011 Clause 30	Ambt. To 300°C Upto 25 mm 0.01 sec to 9.99 hours Upto 175 V Upto 1 A Ambt. To 999°C
		Resistance to Rusting	IS 368:2014 Clause 31 IS 4159 : 2002 (RA 2012) Clause 31, IS 6446 : 1986 (RA 2015) Clause 31, IS 3017 : 1985 (RA 2011) Clause 31, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 31, IS 302 (Part 2/Section 35) : 1993	Ambt. To 100°C RH 20 to 95% 0.01 sec to 9.99 hours

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			Clause 31, IS 302 (Part 2/Section 35) : 2011 Clause 31	
		Finish	IS 366 : 1991 (RA 2011) Clause 17, IS 2082 : 1993 (RA 2009) Clause 22, IS 3017 : 1985 (RA 2011) Clause 33, IS 4159 : 2002 (RA 2012) Clause 33, IS 6446 : 1986 (RA 2015) Clause 33, IS 11879:1986 (RA 2011) Clause 33, IS 8978 : 1992 (RA 2009) Clause 10, IS 302 (Part 2/Section 35) : 201, Clause 10	0.01 sec to 9.99 hours Ambt. To 100°C RH 20 to 95%
		Dimensions	IS 3017 : 1985 (RA 2011) Clause 101	Upto 150 mm
		Thermal Characteristics	IS 3017 : 1985 (RA 2011) Clause 103	Upto 30 A Upto 100°C Upto 480 V
		Heating up Time	IS 366 : 1991 (RA 2011) Clause 10	0.01 sec. to 9.99 hours
		Sole Plate Temperature	IS 366 : 1991 (RA 2011) Clause 11	Upto 300°C
		Temperature Distribution	IS 366 : 1991 (RA 2011) Clause 12	Upto 800°C
		Initial Overswing Temp. and Heating up Excess Temp.	IS 366 : 1991 (RA 2011) Clause 13	Upto 150°C
		Cyclic fluctuation of temperature	IS 366 : 1991 (RA 2011) Clause 14	Upto 300°C
		Thermostatic stability	IS 366 : 1991 (RA 2011) Clause 16	Upto 260°C Upto 200 Hrs.

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				Upto 5 kV AC 0.01 sec. to 9.99 hours
		Verification of Rated Capacity	IS 2082 : 1993 (RA 2009) Clause 15	Upto 200 ltrs.
		Standing loss for 24 Hours	IS 2082 : 1993 (RA 2009) Clause 16	Upto 100°C Upto 30A 0.01 kwh to 9999 kwh Upto 480 V
		Hot water output	IS 2082 : 1993 (RA 2009) Clause 17	Upto 100°C
		Re-heating time	IS 2082 : 1993 (RA 2009) Clause 18	0.01 sec. to 9.99 hours
		Mixing factor	IS 2082 : 1993 (RA 2009) Clause 19	Qualitative
		Deviation of Dial calibration	IS 2082 : 1993 (RA 2009) Clause 20	Qualitative
		Cyclic Temperature variation (Diff.)	IS 2082 : 1993 (RA 2009) Clause 21	Qualitative
		Operation of Flow Switch	IS 8978 : 1992 (RA 2009) Clause 11	Qualitative
		Rating, classification Marking	IS 4159 : 2002 (RA 2012) Clause 5,6 & 7, IS 6446 : 1986 (RA 2015) Clause 5,6 & 7, IS 3017 : 1985 (RA 2011) Clause 5,6 & 7, IS 302 (Part 2/Section 46) : 1993 (RA 2009) Clause 5,6 & 7, IS 302 (Part 2/Section 35) : 1993 Clause 5,6 & 7	Qualitative
		Classification & Marking	IS 302 (Part 2/Section 201) : 2008 Clause 6 & 7, IS 302 (Part 2/Section 3) :	Qualitative

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			2007 (RA 2017) Clause Clause 6 & 7, IS 302 (Part 2/Section 21) : 2011 Clause 6 & 7, IS 302 (Part 2/Section 35) : 2011 Clause 6 & 7	
		Design, Rating & Marking	IS 4250 : 1980 (RA 2009) Clause 5, IS 1475 (Part 1) : 2001 (RA 2017) Clause 9, IS 302 (Part 2/Section 23) : 2009 Clause 5 & 7	Qualitative
		Protection against electric shock	IS 4250 : 1980 (RA 2009) Clause 8, IS 555 : 1979 (RA 2015) Clause 10.11, IS 374 : 1979 (RA 2007) Clause 10.11, IS 302 (Part 2/Section 23) : 2009 Clause 8	Qualitative
		Starting	IS 4250 : 1980 (RA 2009) Clause 9, IS 374 : 1979 (RA 2007) Clause 10. 8, IS 555 : 1979 (RA 2015) Clause 10. 8 IS 6680 : 1992 (RA 2009) Clause 12, IS 302 (Part 2/Section 23) : 2009, Clause 9	Upto 4800W & 300 V
		Input	IS 4250 : 1980 (RA 2009) Clause 10, IS 1475 (Part 1) : 2001 (RA 2017) Clause 5.6.3, IS 374 : 1979 (RA 2007) Clause 10. 9, IS 555 : 1979	Upto 4800W

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			RA 2015) Clause 10.9, IS 6680 : 1992 (RA 2009) Clause 19. 8, IS 302 (Part 2/Section 23) : 2009, Clause 10	
		Temperature Rise	IS 4250 : 1980 (RA 2009) Clause 11, IS 374 : 1979 (RA 2007) Clause 10. 4, IS 555 : 1979 (RA 2015) Clause 10.4, IS 6680 : 1992 (RA 2009) Clause 19.3, IS 302 (Part 2/Section 23) : 2009, Clause 11	Upto 100°C Upto 300V Upto 800°C Upto 30min.
		Electrical insulation and Leakage current at Operating Temperature	IS 4250 : 1980 (RA 2009) Clause 13, IS 302 (Part 2/Section 23) : 2009 Clause 13	Upto 3000µA Upto 5kV AC
		Moisture Resistance	IS 4250 : 1980 (RA 2009) Clause 15, IS 374 : 1979 (RA 2007) Clause 10. 12, IS 555 : 1979 (RA 2015) Clause 10. 12, IS 302 (Part 2/Section 23) : 2009 Clause 15	10 to 100°C 20 % RH to 95% RH
		Insulation Resistance and Electric Strength	IS 4250 : 1980 (RA 2009) Clause 16, IS 374 : 1979 (RA 2007) Clause 10. 7 & 10.6, IS 555 : 1979 (RA 2015) Clause 10.7.1 & 10.6, IS 6680 : 1992 (RA 2009) Clause 19.7 & 19.11, IS 302	500V DC Upto 1000MΩ Upto 5 kV AC 0 to 30 mins.

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			(Part 2/Section 23) : 2009, Clause 16, IS 1475 (Part 1) : 2001 (RA 2017) Clause 7.7.1 & 7.7.2	
		Endurance & Mechanical Endurance	IS 4250 : 1980 (RA 2009) Clause 18, IS 374 : 1979 (RA 2007) Clause 10. 16 IS 555 : 1979 (RA 2015) Clause 10.13, IS 6680 : 1992 (RA 2009) Clause 19.4, IS 7154 : 1994 (RA 2009) Clause 11	Upto 4800W & 300V
		Abnormal Operation	IS 4250 : 1980 (RA 2009) Clause 19, IS 302 (Part 2/Section 23) : 2009, Clause 19	Upto 4800W & 300V
		Stability and Mechanical Hazards	IS 4250 : 1980 (RA 2009) Clause 20, IS 302 (Part 2/Section 23) : 2009, Clause 20	Upto 15°
		Mechanical Strength	IS 374 : 1979 (RA 2007) Clause 10. 13, IS 4250 : 1980 (RA 2009) Clause 21, IS 302 (Part 2/Section 23) : 2009 Clause 21	Upto 2N
		Construction	IS 4250 : 1980 (RA 2009) Clause 22, IS 302 (Part 2/Section 23) : 2009 Clause 22, IS 374 : 1979 (RA 2007) Clause 6, IS 6680 : 1992 (RA 2009) Clause 8	Upto 150 mm

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		Internal Wiring	IS 4250 : 1980 (RA 2009) Clause 23, IS 302 (Part 2/Section 23) : 2009 Clause 23	Qualitative
		Components	IS 4250 : 1980 (RA 2009) Clause 24, IS 302 (Part 2/Section 23) : 2009 Clause 24, IS 1475 (Part 1) : 2001 (RA 2017) Clause 6	Qualitative
		Supply connection & External Flexible Cable and Cords	IS 4250 : 1980 (RA 2009) Clause 25, IS 302 (Part 2/Section 23) : 2009 Clause 25, IS 555 : 1979 (RA 2015) Clause 10. 14	3 to 10 Kg Upto 3000 mm Upto 25 mm
		Terminals and External Conductors	IS 4250 : 1980 (RA 2009) Clause 26, IS 302 (Part 2/Section 23) : 2009 Clause 26	Upto 150 mm
		Provision for Earthing	IS 4250 : 1980 (RA 2009) Clause 27, IS 302 (Part 2/Section 23) : 2009, Clause 27, IS 374 : 1979 (RA 2007) Clause 10.10 IS 555 : 1979 (RA 2015) Clause 10. 10	Upto 30 A, 12 V Up to 3 V
		Screws and Connections	IS 4250 : 1980 (RA 2009) Clause 28, IS 302 (Part 2/Section 23) : 2009 Clause 28	Upto 150 mm Upto 2 NM
		Creepage distance, Clearances & distances through insulation	IS 4250 : 1980 (RA 2009) Clause 29, IS 302 (Part 2/Section 23) : 2009 Clause 29, IS 374 : 1979	Upto 150 mm

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			(RA 2007) Clause 10.15 IS 555 : 1979 (RA 2015) Clause 10. 16	
		Resistance to Heat, Fire and Tracking	IS 4250 : 1980 (RA 2009) Clause 30, IS 302 (Part 2/Section 23) : 2009 Clause 30	Upto 25 mm Ambt. To 200°C Upto 300°C
		Resistance to Rusting	IS 4250 : 1980 (RA 2009) Clause 31, IS 302 (Part 2/Section 23) : 2009 Clause 31	10 to 100°C 20 % RH to 95% RH
		Finish	IS 4250 : 1980 (RA 2009) Clause 33 IS 7154 : 1994 (RA 2009) Clause 39	Qualitative
		Operational / Performance tests	IS 4250 : 1980 (RA 2009) Clause 34, IS 1475 (Part 1) : 2001 (RA 2017) Clause 5 IS 7154 : 1994 (RA 2009) Clause 8.3.6	Upto 4800 W Upto 30 min.
		Temperature withstand	IS 4250 : 1980 (RA 2009) Clause 35	Upto 100°C
		Controls	IS 4250 : 1980 (RA 2009) Clause 36	Upto 10A
		Strength of assembly	IS 4250 : 1980 (RA 2009) Clause 37	Upto 25 kg
		Capacity	IS 1475 (Part 1) : 2001 (RA 2017) Clause 5.6.2	Upto 1 l
		Cooling capacity Rating	IS 1475 (Part 1) : 2001 (RA 2017) Clause 7.7.3	Upto 50°C Upto 4800 W
		Maximum operating condition	IS 1475 (Part 1) : 2001 (RA 2017) Clause 7.7.4	Upto 4800 W Upto 50°C

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		Air Delivery	IS 374 : 1979 (RA 2017) Clause 10. 3 IS 555 : 1979 (RA 2015) Clause 10.3, IS 6680 : 1992 (RA 2009) Clause 19.2	Upto 18 m/s Upto 30 min.
		Fan Speed	IS 374 : 1979 (RA 2007) Clause 10. 9 IS 555 : 1979 (RA 2015) Clause 10.9, IS 6680 : 1992 (RA 2009) Clause 19.9	Upto 18000 rpm
		Power factor	IS 6680 : 1992 (RA 2009) Clause 19.5	Upto UPF
		AC leakage	IS 374 : 1979 (RA 2007) Clause 10. 5 IS 555 : 1979 (RA 2015) Clause 10.5, IS 6680 : 1992 (RA 2009) Clause 19.6	Upto 3000 μ A
		Flash	IS 374 : 1979 (RA 2007) Clause 10. 6.5, IS 6680 : 1992 (RA 2009) Clause 19.10	Upto 5 kV AC
		High operating Voltage	IS 6680 : 1992 (RA 2009) Clause 19.7	Upto 300 V DC
		Over load protection of Transformers & Associated circuits	IS 302 (Part 2/Section 23) : 2009 Clause 17	Upto 100°C Upto 300V Upto 800°C Upto 30min
		Suspension system i) Torsion ii) Tensile	IS 374 : 1979 (RA 2007) Clause 10. 14	Upto 500 Kg.cm. Upto 25kN

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V. POWER STABILISERS AND UPS- SERVO OPERATED AC VOLTAGE STABILIZER				
1.	Continuously variable voltage auto transformers	Insulation Resistance	IS 5142 : 1969 (RA 2016) Clause 10.6 IS 8447:1989 (RA 2008) Clause 12.4 IS 8448 : 1989 (RA 2008) Clause 12.4 IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.4	500 V DC Upto 100 MΩ
	Manually operated voltage regulators for domestic use			
	Automatic line voltage correctors	High Voltage	IS 5142 : 1969 (RA 2016) Clause 10.8, IS 8447:1989 (RA 2008) Clause 12.5, IS 8448 : 1989 (RA 2008) Clause 12.5, IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.5	Upto 5 kV AC upto 30 minute
		Construction requirements & markings	IS 5142 : 1969 (RA 2016) Clause 5 & 9	Upto 150mm
		Endurance	IS 5142 : 1969 (RA 2016) Clause 10.2, IS 8447:1989 (RA 2008) Clause 12.9	Upto 1000A Upto 4800VA Upto 300V
		No load current	IS 5142 : 1969 (RA 2016) Clause 10.3, IS 8447:1989 (RA 2008) Clause 12.6, IS 8448 : 1989 (RA 2008) Clause 12.6, IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.7	Upto 500 mA

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		Variation of output voltage	IS 5142 : 1969 (RA 2016) Clause 10.4, IS 8447:1989 (RA 2008) Clause 12.3 IS 8448 : 1989 (RA 2008) Clause 12.3, IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.6	Upto 1000 V
		Load losses	IS 5142 : 1969 (RA 2016) Clause 10.5, IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.9	Upto 4800 VA
		Temperature Rise	IS 5142 : 1969 (RA 2016) Clause 10.7, IS 8447:1989 (RA 2008) Clause 12.7, IS 8448 : 1989 (RA 2008) Clause 12.7, IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.12	Upto 250°C
		Induced voltage	IS 5142 : 1969 (RA 2016) Clause 10.9, IS 8447:1989 (RA 2008) Clause 12.8 IS 8448 : 1989 (RA 2008) Clause 12.8 IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.10	Upto 250 Hz 1250 V
		Moisture Resistance	IS 8447:1989 (RA 2008) Clause 7.3	10 to 100°C 20% RH to 95% RH
		Clearance & Creepage	IS 8447:1989 (RA 2008) Clause 7.8 IS 8448 : 1989 (RA 2008) Clause 7.7	Upto 150 mm

Prachi Kukreti
Convenor

N. Venkateswaran
Program Director

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		Continuous operation	IS 8448 : 1989 (RA 2008) Clause 12.11 IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.11	Upto 100A Upto 30 minutes
		No load losses	IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.8	Upto 4800 VA
		Rate of correction	IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.13	Upto 300V Upto 30 min.
		Locked rotor test for servo motor	IS 9815 (Part 1) : 1994 (RA 2009) Clause 11.14	Upto 1000 A
		Visual Examination & Inspection	IS 8447:1989 (RA 2008) Clause 12.2, IS 8448 : 1989 (RA 2008) Clause 12.2, IS 9815 (Part 1) : 1994 (RA 2009) Clause 6 & 10	Qualitative
		Protection against electric shock	IS 8447:1989 (RA 2008) Clause 7.1 IS 8448 : 1989 (RA 2008) Clause 7.1	Qualitative
		Stability	IS 8447:1989 (RA 2008), Clause 7.4 IS 8448 : 1989 (RA 2008) Clause 7.3	Upto 15°
		Terminals	IS 8447:1989 (RA 2008) Clause 10.1 IS 8448 : 1989 (RA 2008) Clause 10.1	Upto 150 mm Upto 1.2 Nm
		Screws & Connection	IS 8447:1989 (RA 2008) Clause 7.7 IS 8448 : 1989 (RA 2008) Clause 7.6	Upto 150 mm
		Leakage current	IS 8447:1989 (RA 2008)	Upto 3000µA

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			Clause 7.2, IS 8448 : 1989 (RA 2008) Clause 7.2, IS 9815 (Part 1) : 1994 (RA 2009) Clause 7.3	
		Earthing	IS 8447:1989 (RA 2008) Clause 7.6, IS 8448 : 1989 (RA 2008) Clause 7.5, IS 9815 (Part 1) : 1994 (RA 2009) Clause 7.2	Upto 30A, 12V Up to 3V
VI	BATTERIES			
1.	Multipurpose Dry Batteries Heavy Duty Dry Batteries	Checking of Dimensions & Terminals	IS 8144 : 1997 (RA 2008) Clause 5 & 7 IS : 9128 : 1999 (RA 2009) Clause 5 & 7	10 mm to 70 mm
		Materials & Construction	IS 8144 : 1997 (RA 2008) Clause 6 IS 9128 : 1999 (RA 2009) Clause 6	Qualitative
		Checking of Markings	IS 8144 : 1997 (RA 2008) Clause 9 IS 9128 : 1999 (RA 2009) Clause 9	Qualitative
		Initial Life in 3 ranges	IS 6303 : 1984 (RA 2010) Clause 7.5	0.9 V to 2 V, DC
		Delayed life	IS 6303 : 1984 (RA 2010) Clause 7.7	0.9 V to 2 V, DC
		Delayed life under dry heat conditions	IS 6303 : 1984 (RA 2010) Clause 7.8	0.9 V to 2 V, DC 10 °C to 50°C 20 % RH to 95% RH

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		Leakage	IS 6303 : 1984 (RA 2010) Clause 7.6 of IS : 9128 : 1999 (RA 2009) Clause 10.7	0.7 V to 2 V DC
VII. MEASURING INSTRUMENTS- ELECTRICAL AND ELECTRONIC (STATIC) ENERGY METERS				
1.	A.C . Static Watt-Hour Meters, Class 1 & 2 A C Watt-Hour Meters, Class 0.5,1 & 2 A C Static transformer operated Watt-Hour &var -hour Meters,	Ratings	IS 13010 : 2002 (RA 2017) Clause 5 IS 13779 : 1999 (RA 2014) Clause 5 IS 14697 : 1999 (RA 2009) Clause 5	Qualitative
		General and Constructional Requirements	IS 13010 : 2002 (RA 2017) Clause 6, IS 13779 : 1999 (RA 2014) Clause 6, IS 14697 : 1999 (RA 2009) Clause 6	Upto 150mm
		Marking	IS 13010 : 2002 (RA 2017) Clause 8 IS 13779 : 1999 (RA 2014) Clause 7 IS 14697 : 1999 (RA 2009) Clause 7	Qualitative

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		Impulse Voltage	IS 13010 : 2002 (RA 2017) Clause 11.10.2 IS 13779 : 1999 (RA 2014) Clause 12.7.6.2 IS 14697 : 1999 (RA 2009) Clause 12.7.6.2	0.2 to 10 kV, Charging time =10 sec. Impulse rise time / duration = 1.2 / 50 μ sec
		AC High voltage	IS 13779 : 1999 (RA 2014) Clause 12.7.6.3 IS 14697 : 1999 (RA 2009) Clause 12.7.6.3	Upto 5 kV AC
		Insulation	IS 13779 : 1999 (RA 2014) Clause 12.7.6.4 IS 14697 : 1999 (RA 2009) Clause 12.7.6.4	500 V DC Upto 100 M Ω
		Insulation Resistance	IS 13010 : 2002 (RA 2017) Clause 11.2	500 V DC Upto 100 M Ω
		Running with No load	IS 13010 : 2002 (RA 2017) Clause 11.3	Upto 415 V
		Starting	IS 13010 : 2002 (RA 2017) Clause 11.4	2mA to1000 mA
		Limits of errors	IS 13010 : 2002 (RA 2017) Clause 11.5, IS 13779 : 1999 (RA 2014) Clause 11.1, IS 14697 : 1999, Clause 11.1	Up to 100A,415 V
		Interpretation of Test Result and Adjustment (if required)	IS 13010 : 2002 (RA 2017) Clause 11.7 IS 13779 : 1999 (RA 2014) Clause 12.16 IS 14697 : 1999 (RA 2009)	Up to 100A,415 V

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		Meter constant	Clause 12.15 IS 13010 : 2002 (RA 2017) Clause 11.6 IS 13779 : 1999 (RA 2014) Clause 12.15 IS 14697 : 1999 (RA 2009) Clause 12.14	Up to 100A,415 V
		Starting conditions	IS 13779 : 1999 (RA 2014) Clause 12.14 IS 14697 : 1999 (RA 2009) Clause 12.13	Up to 1000mA,415 V
		No-load condition	IS 13779 : 1999 (RA 2014) Clause 12.13 IS 14697 : 1999 (RA 2009) Clause 12.12	Upto 415 V
		Ambient temp. influence	IS 13779 : 1999 (RA 2014) Clause 12.12 IS 14697 : 1999 (RA 2009) Clause 12.11	-30°C to 75°C
		Repeatability of error	IS 13010 : 2002 (RA 2017) Clause 11.19 IS 13779 : 1999 (RA 2014) Clause 12.17 IS 14697 : 1999 (RA 2009) Clause 12.16	Up to 100A,415 V
		Power loss	IS 13010 : 2002 (RA 2017) Clause 11.8	Upto 4800 VA
		Heating	IS 13010 : 2002 (RA 2017) Clause 11.9	Upto 100 A,415 V Upto 20KΩ
		High Voltage	IS 13010 : 2002 (RA 2017) Clause 11.10.3	Upto 5 kV AC upto 30minute

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		Effect of Influence Quantities	IS 13010 : 2002 (RA 2017) Clause 11.11 IS 13779 : 1999 (RA 2014) Clause 12.11 IS 14697 : 1999 (RA 2009) Clause 12.10	Upto 100A,415 V
		Power consumption	IS 13779 : 1999 (RA 2014) Clause 12.7.1 IS 14697 : 1999 (RA 2009) Clause 12.7.1	Upto 8300VA
		Influence of supply voltage	IS 13779 : 1999 (RA 2014) Clause 12.7.2 IS 14697 : 1999 (RA 2009) Clause 12.7.2	230 to 250V
		Influence of short time over currents	IS 13779 : 1999 (RA 2014) Clause 12.7.3 IS 14697 : 1999 (RA 2009) Clause 12.7.3	Up to 2000A
		Influence of self-heating	IS 13779 : 1999 (RA 2014) Clause 12.7.4 IS 14697 : 1999 (RA 2009) Clause 12.7.4	Upto 100A,415 V
		Influence of Heating	IS 13779 : 1999 (RA 2014) Clause 12.7.5 IS 14697 : 1999 (RA 2009) Clause 12.7.5	Up to 800°C

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		Immunity to Earth / Phase fault	IS 13779 : 1999 (RA 2014) Clause 12.8 IS 14697 : 1999 (RA 2009) Clause 12.17	Upto 100A,415 V
		Dry heat	IS 13779 : 1999 (RA 2014) Clause 12.6.1 IS 14697 : 1999 (RA 2009) Clause 12.6.1	Upto 75°C
		Cold	IS 13779 : 1999 (RA 2014) Clause 12.6.2 IS 14697 : 1999 (RA 2009) Clause 12.6.2	0 to -30°C
		Damp heat cyclic	IS 13779 : 1999 (RA 2014) Clause 12.6.3, IS 14697 : 1999 (RA 2009) Clause 12.6.3	10°C to 100°C, RH : 20 % to 95 %
		Vibration	IS 13010 : 2002 (RA 2017) Clause 11.20, IS 13779 : 1999 (RA 2014) Clause 12.3.2, IS 14697 : 1999 (RA 2009) Clause 12.3.2	Max. displacement : 18 mm (Peak to Peak) Frequency Range : 5 Hz to 3500 Hz. (bare table) Max. acceleration : 80g (bare table)
		Shock	IS 13779 : 1999 (RA 2014) Clause 12.3.1, IS 14697 : 1999 (RA 2009) Clause 12.3.1	Upto 80 g

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		Spring hammer	IS 13779 : 1999 (RA 2014) Clause 12.3.3 IS 14697 : 1999 (RA 2009) Clause 12.3.3	0.22 Nm
		Protection against i) penetration of dust & ii) water	IS 13010 : 2002 (RA 2017) Clause 11.24 IS 13779 : 1999 (RA 2014) Clause 12.5 IS : 14697-1999 Clause 12.5	Upto IP 51
		Resistance to heat & fire	IS 13010 : 2002 (RA 2017) Clause 11.23, IS 13779 : 1999 (RA 2014) Clause 12.4, IS 14697 : 1999 (RA 2009) Clause 12.4	Ambt. to 999°C, Upto 99.9 sec
		Mechanical strength of meter case	IS 13010 : 2002 (RA 2017) Clause 11.25	0.22 Nm
		Sustained accuracy	IS 13010 : 2002 (RA 2017) Clause 11.16	Upto 100 A, 415V
		Running at low load	IS 13010 : 2002 (RA 2017) Clause 11.17	2mA to 1000 mA, 415V
		Shock (acceptance test)	Clause 11.21.1 of IS : 13010-2002	0.6Nm
		Material used in dial	IS 13010 : 2002 (RA 2017) Clause 11.18	Upto 100 A, 415V
		Driving torque measurement	IS 13010 : 2002 (RA 2017) Clause 11.22	Upto 100 A, 415V
VIII.	ELECTRICAL MATERIALS - SOLID INSULATING MATERIALS			
1.	Tapes Pressure Sensitive /	General Requirements	IS 2448 (Part 1) : 1963 (RA 2015) Clause 3,	0.1 mm to 45 mm

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	adhesive tapes		IS 7809 (Part 3/Section 1) : 1986 (RA 2016) Clause 3	
		Checking of Dimensions	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.3	0.1 mm to 25 mm
		Direction of slitting	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.4	Qualitative
		Markings	IS 2448 (Part 1) : 1963 (RA 2015) Clause 8	Qualitative
		Breaking strength	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.5	10 N to 100 N
		Test for pin holes	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.6	Qualitative
		Adhesion	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.7	10 mm to 300 mm 1 N to 10 N
		Freedom from corrosive chemicals / Electrolytic corrosion	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.8, IS 8516 : 1977 (RA 2016) Clause 3	Ambt. to 200°C 1 N to 10 N
		Electric Strength & Insulation Resistance	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.9, IS 8516 : 1977 (RA 2016) Clause 4	1 kV to 7.5 kV AC 1.3GΩ to1000GΩ 500V to 1000 V DC
		Test after ageing	IS 2448 (Part 1) : 1963 (RA 2015) Clause10.10	1 mm to 300 mm Ambt. to 200 °C
		Types & Designations	IS 7809 (Part 3/Section 1) : 1986 (RA 2016) Clause 2	
		Adhesion to Steel	IS 7809 (Part 2) : 1977 (RA 2016) Clause 10.3.2	1 N to 10N
		Adhesion to Backing	IS 7809 (Part 2) : 1977 (RA 2016) Clause 10.3.3	1 N to 10N
		Electric Strength at RT & after humidity	IS 7809 (Part 2) : 1977 (RA 2016) Clause 12 &13	1 kV to 7.5 kV, AC 10 °C to 100°C

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				20 % RH to 95% RH
		Stability to Accelerated Ageing	IS 7809 (Part 3/Section 1) : 1986 (RA 2016) Clause 4.8	10°C to 100°C 20 % RH to 95% RH
		Tensile strength & elongation at break	IS 7809 (Part 2) : 1977 (RA 2016) Clause 9	10 N to 100N 1 mm to 300 mm
		Flammability	IS 7809 (Part 2) : 1977 (RA 2016) Clause 6	1 mm to 300 mm 1 sec. to 30 min.