

Laboratory TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7936

Page 1 of 13

Validity 26.09.2018 to 25.09.2020

Last Amended on 18.03.2019

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

### ELECTRICAL TESTING

<b>I. WIRING ACCESSORIES</b>				
1.	<b>Conduits for Electrical Installations - Rigid Plain Conduits of Insulating Material</b>	Classification, Marking, Construction	IS 9537 (Part 3)	Qualitative
		Dimensions	IS 9537 (Part 3)	20 mm to 50 mm
		Bending	IS 9537 (Part 3)	Qualitative
		Compression	IS 9537 (Part 3)	Qualitative (Upto 5000 N 0.01 mm to 150 mm)
		Impact	IS 9537 (Part 3)	Qualitative {(-) 20°C to 60°C}
		Collapse	IS 9537 (Part 3) Restricted for 20 mm & 25 mm	Qualitative {(-) 20°C to 60°C}
		Resistance to Heat	IS 9537 (Part 3)	Upto 400°C 0.01 mm to 200 mm
		Resistance to burning	IS 9537 (Part 3)	0.1 second to 30 minutes
	Electrical Characteristics (Electrical Strength)	IS 9537 (Part 3) IS 9537 (Part 1)	Qualitative (0.1 kV to 10 kV ac)	
	Insulation Resistance in conduit	IS 9537 (Part 3) IS 9537 (Part 1)	1 to 100 x 10 <sup>6</sup> MΩ/ 1000 V dc	
<b>II. CABLE &amp; ACCESSORIES</b>				
1.	<b>Polyvinyl Chloride Insulated unsheathed and sheathed cables/ cords with rigid and flexible conductor for rated voltages</b>	Annealing test (for Copper)	IS 10810 (Part 1) IS 8130 IS 694	1 mm to 1000 mm/ 1mm Upto 40%
		Tensile Test (for Aluminium)	IS 10810 (Part 2) IS 8130 IS 694	2 N to 50 kN/ 2N

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 2 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
	upto and including 1100V	Wrapping Test (for Aluminium)	IS 10810 (Part 3) IS 8130 IS 694	Qualitative
		Thickness of Insulation & Sheath	IS 10810 (Part 6) IS 694	0.001 mm to 25 mm/ 0.001 mm 0.01 mm to 50 mm/ 0.01 mm
		Loss of Mass on Insulation & Sheath	IS 10810 (Part 10) IS 694	0.1 mg to 200 g/ 0.1 mg
		Ageing in Air Oven on Insulation & Sheath	IS 10810 (Part 11) IS 694	Ambient to 400 <sup>o</sup> C/ 0.1 <sup>o</sup> C TS Variation up to ±50% Elongation variation up to ±50%
		Shrinkage Test on Insulation & Sheath	IS 10810 (Part 12) IS 694	Ambient to 400 <sup>o</sup> C/ 0.1 <sup>o</sup> C Upto 10%
		Heat Shock Test on Insulation & Sheath	IS 10810 (Part 14) IS 694	Ambient to 400 <sup>o</sup> C/ 0.1 <sup>o</sup> C
		Hot Deformation Test on Insulation & Sheath	IS 10810 (Part 15) IS 694	Ambient to 400 <sup>o</sup> C/ 0.1 <sup>o</sup> C up to 100%
		Thermal Stability Test on Insulation & Sheath	IS 10810 (Part 60) IS 694	1 sec to 24Hr /1sec Ambient to 250 <sup>o</sup> C/ 0.5 <sup>o</sup> C
		Cold Bend Test on Insulation & Sheath	IS 10810 (Part 20) IS 694	Qualitative
		Cold Impact Test on Insulation & Sheath	IS 10810 (Part 21) IS 694	Qualitative
		High Voltage Test at Room Temperature	IS 10810 (Part 45) IS 694	Qualitative (0.01 to 5 kV/ 0.01 kV)
		High Voltage Test (Water Immersion AC & DC)	IS 10810 (Part 45) IS 694	Qualitative (0.2 kV to 10 kV 0.01 kV to 3 kV)
		Flammability test	IS 694 IS 10810 (Part 53)	1 mm to 600 mm/ 1 mm 0.1 sec to 99.9 sec/ LC-0.1 sec 0.1 mg to 200 g/0.1 mg

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 3 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Additional Ageing Test	IS 694	Qualitative
		Durability & Legibility Test	IS 694	Qualitative
		Ovality	IS 694	Upto 25%
		Conductor Resistance Test	IS 10810 (Part 5) IS 8130 Cl. No. 7.3 IS 694 Table 1.iii. a.4	0.2 $\mu\Omega$ to 11 $\Omega$
		Persulphate Test (for tinned copper conductor cable only)	IS 10810 (Part 4) IS 694 Table 1.iii.a.5 IS 8130 Cl. No. 7.1.1	Upto 5 g/m <sup>2</sup>
		Test for overall dimensions	IS 694 Table 1.iii.b, Tables 3 to 10	0.01 mm to 150 mm 0.001 mm to 25 mm
		Tensile Strength and Elongation at Break on Insulation & Sheath	IS 10810 (Part -7) IS 694 Table 1.iii.c.1 Table 1.iii. d.1	0.1N to 2500N Up to 800 %
		Insulation Resistance	IS 10810 (Part -43)	2 M $\Omega$ to 20 G $\Omega$ At 100 to 1000 Vdc
		Volume Resistivity	IS 694 IS 5831 IS 10810 (Part-43)	Up to 1017 $\Omega$ -cm
		Copper Purity	IS 191	0.0001 g to 200 g Upto 100 %
<b>2.</b>	<b>Fire Retardant Low Smoke Zero Halogen Cables</b>	Oxygen Index Test	IS 10810 (Part 58) IS 10810 (Part 64) ASTM D 2863 IS 694 IS 1554 (Part 1 & 2) IS 7098 (Part 2)	10 % to 98 % Ambient to 500 $^{\circ}$ C
		Halogen Acid Gas Evolution Test	IS 10810 (Part 59) IEC 60754 (Part 1) IS 694 IS 1554 (Part 1 & 2) IS 7098 (Part 1 & 2)	0.0001 g to 200 g/ 0.0001 g Upto 30 %

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 4 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Flame Retardance on Single Cable	IS 10810 (Part 61) IS 1554 (Part 1 & 2) IS 7098 (Part 1 & 2)	1 mm to 800 mm/ 1 mm
		Smoke Density Rating	ASTM D 2843 IS 13360 (Part 6) IS 694	1 % to 100 %
		Temperature Index Test	IS 10810 ASTM D2863 IS 694 Table 1.iii.c.12 Table 1.iii.d.9, Cl. No. 10.7 IS:1554 (Part 1) Cl. No. 15.1.1.C1.d Cl. No. 15.1.1.C2.g IS 1554 (Part 2) Cl. No. 18.1.3.C1.d Cl. No. 18.1.3.C2.g IS 7098 (Part 1) Cl. 15.1.1.C1.d Cl. 15.1.1.C2.g IS:7098 (Part 2) Cl. 19.1.3.C1.d) Cl. 19.1.3.C2.f)	Ambient to 500 °c
		Flame Retardance Test on Bunched cable	IS 10810 (Part-62) IEC 60332-3-21 IEC 60332-3-22 IEC 60332-3-23 IEC 60332-3-24 IEC 60332-3-25 IS 1554 (Part -1) Cl. No. 15.1.1.C1.c) Cl. No. 15.1.1.C2.c)	1 mm to 5 m

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

Page 5 of 13

**Validity** 26.09.2018 to 25.09.2020

Last Amended on 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
			IS 1554 (Part 2) Cl. No. 18.1.3.C1.c) Cl. No. 18.1.3.C2.c)  IS 7098 (Part 1) Cl. 15.1.1.C1.c Cl. 15.1.1.C2.c  IS 7098 (Part 2) Cl. No. 19.1.3.C1.c) Cl. No. 19.1.3.C2.c)	
		Measurement of Smoke Density of Electrical Cables under fire conditions	IS 10810 (Part 63) IEC 61034-2	1 % to 100 %
		pH and Conductivity	IEC 60754-2	0 to 14 pH Upto 10 µs/mm
3.	Aerial Bunched Cables for working voltages upto and including 1100 V	Wrapping Test on Phase/ Street Light Conductor	IS 10810 (Part 3) IS 8130 IS 14255	Qualitative
		Resistance Test on Messenger Conductor	IS 10810 (Part 5) IS 14255	0.2 µΩ to 11 Ω
		Ageing in Air Oven	IS 10810 (Part 11) IS 14255	Ambient to 400 °C /0.1 °C TS Variation up to 50% Elongation variation Upto ±50%
		Hot Set Test	IS 10810 (Part 30) IS 14255	0.5 mm to 300 mm/0.5mm Upto 150 %
		Shrinkage Test	IS 10810 (Part 12) IS 14255	Ambient to 200 °C /0.1 °C Up to 10 %
		Bending Test on Complete Cable	IS 14255	Qualitative
		Test for thickness of Insulation	IS 10810 (Part 8) IS 14255	0.01 mm to 150 mm 0.001 mm to 25 mm
		High Voltage	IS 10810 (Part 45) IS 14255	0.01 kV to 5 kV

Ravi Johri  
Convenor

Alok Jain  
Program Manager

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 6 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Tensile Test on Phase/street light conductor	IS 10810 (Part 2) IS 8130 Cl. No. 7.2.1 IS 14255 Cl. No. 10.1.a.i	2N to 50 kN /2N
		Resistance Test on Phase/street light conductor	IS 10810 (Part 5) (RA 2016) IS 8130:2013 (RA 2018) Cl. 7.3 IS 14255:1995 (RA 2015) Cl. 10.1.a.iii	0.2 $\mu\Omega$ to 11 $\Omega$
		Breaking Load on messenger conductor	IS:10810 (Part-2) -1984 (RA 2016) IS 14255:1995 (RA 2015) Cl. 10.1.b.i, Cl. 6.5	2N to 50 kN
		Elongation Test on messenger Conductor	IS 14255:1995 (RA 2015) Cl. 10.1.b.ii, Cl. 11.3	Up to200%
		Tensile Strength and Elongation at break	IS:10810 (Part-7) – 1984 (RA 2016) IS 14255:1995 (RA 2015) Cl. 10.1.c.i, Table 1 IS 14255:1995 (RA 2015) Cl. 10.1.d.i, Table 2	0.1N to 2500N/0.1N Up to 800 %
		Water Absorption (Gravimetric)	IS:10810 (Part-33) -1984 (RA 2016) IS 14255:1995 (RA 2015) Cl. 10.1.c.v, Table 1	Up to 4mg/cm <sup>2</sup>
		Carbon Black Content & Dispersion	IS:10810 (Part-32) -1984 (RA 2016) IS 14255:1995 (RA 2015) Cl. 10.1.c.vi, Table 1 IS 14255:1995 (RA 2015) Cl. 10.1.d.iii, Table 2	0 - 8 %
		Melt Flow Index	IS:10810 (Part-23) -1984 (RA 2016) IS 14255:1995 (RA 2015) Cl. 10.1.d.ii, Table 2	0 – 5 g/s

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 7 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Vicat Softening Point	IS 10810 (Part-22) - 1984 (RA 2016) IS 14255:1995 (RA 2015) Cl. 10.1.d.iv, Table 2	0 - 200°C
		Volume Resistivity Test	IS 10810 (Part-43) - 1984 (RA 2016) IS 14255:1995 (RA 2015) Cl. 10.1.f, Table 1, Table 2	Up to 10 <sup>17</sup> Ohm -cm
4.	<b>Cross Linked Polyethylene Insulated Thermoplastic Sheathed cables for working voltages upto and including 1100 V and 3.3 kV up to and including 33 kV</b>	Annealing test (for Copper)	IS 10810 (Part 1) IS 8130 IS 7098 (Part 1 & 2)	1 N to 5000 N Upto 50 %
		Tensile Test (for Aluminum)	IS 10810 (Part 2) IS 8130 IS 7098 (Part 1 & 2)	1 N to 50 kN/ 1 N
		Wrapping Test (for Aluminum)	IS 10810 (Part 3) IS 8130 IS 7098 (Part 1 & 2)	Qualitative
		Dimension for armoring material	IS 10810 (Part 36) IS 7098 (Part 1 & 2) IS 3975	0.01 mm to 150 mm/ 0.01mm 0.01 mm to 25 mm/ 0.01 mm
		Torsion on Galvanized steel wire	IS 10810 (Part 38) IS 7098 (Part 1 & 2) IS 3975	Qualitative
		Winding on Galvanized steel strips	IS 10810 (Part 39) IS 7098 (Part 1 & 2) IS 3975	Qualitative
		Resistivity & Conductance test of Armour (Wires/strips)	IS 10810 (Part 42) IS 7098 (Part 1 & 2) IS 3975	Upto 17 x 10 <sup>-6</sup> ohm cm
		Test for Thickness of Insulation (eccentricity) & Sheath	IS 10810 (Part 6) IS 7098 (Part 1 & 2)	0.01 mm to 150 mm/ 0.01 mm 0.001 mm to 25 mm/ 0.001 mm

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 8 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Ageing in air oven on Insulation & Sheath	IS 10810 (Part 11) IS 7098 (Part 1 & 2)	Ambient to 200°C/ 0.1 °C TS Variation up to 50% Elongation variation Upto ±50%
		Hot Set Test	IS 10810 (Part 30) IS 7098 (Part 1 & 2)	0.5 mm to 300 mm/ 0.5 mm Upto 150 %
		Loss of Mass in Air Oven	IS 10810 (Part 10) IS 7098 (Part 1 & 2)	0.1 mg to 200 g/ 0.1 mg
		Shrinkage Test on Insulation & Sheath	IS 10810 (Part 12) IS 7098 (Part 1 & 2)	Ambient to 200°C/ 0.1 °C 0 to 10 %
		Hot Deformation Test	IS 10810 (Part 15) IS 7098 (Part 1 & 2)	Ambient to 200 °C /0.1 °C Up to 100%
		Heat Shock	IS 10810 (Part 14) IS 7098 (Part 1 & 2)	Qualitative
		Thermal Stability	IS 10810 (Part 60) IS 7098 (Part 1 & 2)	1 sec to 24 Hr/ 1sec Ambient to 250 °C/ 0.5 °C
		High Voltage Test at room temperature	IS 10810 (Part 45) IS 7098 (Part 1 & 2)	0.1 kV to 10 kV/0.1 kV
		Flammability	IS 10810 (Part 53) IS 7098 (Part 1 & 2)	1mm to 600 mm/ 1 mm
		Conductor Resistance	IS 10810 (Part 5) IS 8130 Cl. No. 7.3 IS 7098 (Part 1) Cl. No. 15.1.a.iv IS 7098 (Part 2) Cl. No. 19.1.i.d	0.2 μΩ to 11Ω
		Tensile strength Elongation at break	IS 10810 (Part 37) IS:7098 (Part 1) Cl. No. 13.6 (a) Cl. No. 13.6 (b) IS 7098 (Part 2) Cl. No. 19.1.ii IS 3975 Cl. No. 8	1 N to 50KN Up to 20%

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager



**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 9 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Uniformity Zinc coating	IS 10810 (Part 40) IS 7098 (Part 1) Cl. No. 13.6 (e) IS 7098 (Part 2) Cl. No. 19.1.ii IS 3975 Cl. No. 9.2	Qualitative
		Mass Zinc Coating	IS 10810 (Part-41) IS 7098 (Part 1) Cl. No.13.6 (f) IS 7098 (Part 2) Cl. No. 19.1.ii IS 3975 Cl. No. 9.1	Upto 600 gm/m <sup>2</sup>
		Armour Coverage Percentage Test	IS 7098 (Part 1) Cl. No. 13.1.2 IS 7098 (Part 2) Cl. No. 17.2	Up to 100%
		Tensile Strength and Elongation at Break on Insulation & Sheath	IS 10810 (Part 7) IS 7098 (Part 1) Cl. No. 15.1.d.i, Table 1 IS 7098 (Part 1) Cl. 15.1.e.i IS 7098 (Part 2) Cl. 19.1.iii.a Table 1 IS 7098 (Part 2) Cl. No. 19.1.vi.a	0.1 N to 2500 N Up to 800 %
		Water Absorption (Gravimetric)	IS 10810 (Part 33) IS 7098 (Part 1) Cl. 15.1.d.v, Table 1 IS 7098 (Part 2)	Up to 4 mg/cm <sup>2</sup>
		Volume Resistivity Test	IS 10810 (Part 43) IS 7098 (Part 1) Cl. No. 15.1.f, Table 1 IS 7098 (Part 2) Cl. No. 19.1.xi, Table 1	Up to 1017 Ωcm

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager

Laboratory

TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number

TC-7936

Page 10 of 13

Validity

26.09.2018 to 25.09.2020

Last Amended on 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
5.	PVC Insulated (Heavy Duty) Electric cables for working voltages up to 1100 V and from 3.3 kV to 11 kV	Annealing test (for Copper)	IS 10810 (Part 1) IS 8130 IS 1554 (Part 1 & 2)	1 N to 5000 N Upto 50 %
		Tensile Test (for Aluminium)	IS 10810 (Part 2) IS 8130 IS 1554 (Part 1 & 2)	1 N to 50 kN/ 1 N
		Wrapping Test (for Aluminium)	IS 10810 (Part 3) IS 8130 IS 1554 (Part 1 & 2)	Qualitative
		Dimension for armoring material	IS 10810 (Part 36) IS 1554 (Part 1 & 2) IS 3975	0.01 mm to 150 mm/ 0.01 mm 0.01 mm to 25 mm/ 0.01 mm
		Torsion on Galvanized steel wire	IS 10810 (Part 38) IS 1554 (Part 1 & 2) IS 3975	Qualitative
		Winding on Galvanized steel strips	IS 10810 (Part 39) IS 1554 (Part 1 & 2) IS 3975	Qualitative
		Resistivity & Conductance test of Armour (Wires/strips)	IS 10810 (Part 42) IS 1554 (Part 1 & 2) IS 3975	Upto $17 \times 10^{-6}$ ohm cm
		Test for Thickness of Insulation & Sheath	IS 10810 (Part 6) IS 1554 (Part 1 & 2)	0.01 mm to 150 mm/ 0.01 mm 0.001 mm to 25 mm/ 0.001 mm
		Ageing in air oven on Insulation & Sheath	IS 10810 (Part 11) IS 1554 (Part 1 & 2)	Ambient to 200°C/ 0.1 °C TS Variation up to 50% Elongation variation Upto ±50%
		Shrinkage Test on Insulation & Sheath	IS 10810 (Part 12) IS 1554 (Part 1 & 2)	Ambient to 200 °C/ 0.1 °C Upto 10 %
		Hot Deformation Test	IS 10810 (Part 15) IS 1554 (Part 1 & 2)	Ambient to 200 °C /0.1 °C Upto 100 %

Ravi Johri  
Convenor

Alok Jain  
Program Manager

**Laboratory** TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

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

**Certificate Number** TC-7936

**Page 11 of 13**

**Validity** 26.09.2018 to 25.09.2020

**Last Amended on** 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Loss of Mass in Air Oven	IS 10810 (Part 10) IS 1554 (Part 1 & 2)	0.1 mg to 200 g/ 0.1 mg
		Heat Shock Test	IS 10810 (Part 14) IS 1554 (Part 1 & 2)	Ambient to 200 °C/ 0.1 °C
		Thermal Stability Test	IS 10810 (Part 60) IS 1554 (Part 1 & 2)	1 sec to 24 Hr/ 1 sec Ambient to 250 °C/0.5 °C
		Conductor Resistance Test	IS 10810 (Part 5) IS 8130 Cl. No. 7.3 IS 1554 (Part 1) Cl. No. 15.1.a.4 IS 1554 (Part 2) Cl. No. 19.1.a.4	0.2 µΩ to 11Ω
		Tensile strength Elongation at break	IS 10810 (Part 37) IS 1554 (Part 1) Cl. No. 13.6 (a) Cl. No. 13.6 (b) IS 1554 (Part 2) Cl. No. 18.1.b IS 3975 Cl. No. 8	1 N to 50KN Up to 20%
		Uniformity Zinc coating	IS 10810 (Part 40) IS 1554 (Part 1) Cl. No. 13.6 (e) IS 1554 (Part 2) Cl. No. 18.1.b IS 3975 Cl. No. 9.2	Qualitative
		Mass Zinc Coating	IS 10810 (Part 41) IS 1554 (Part 1) Cl. No. 13.6 (f) IS 1554 (Part 2) Cl. No. 18.1.b IS 3975 Cl. No. 9.1	Upto 600 gm/m <sup>2</sup>
		Armour Coverage Percentage Test	IS 1554 (Part 1) Cl. No. 13.1.2 IS 1554 (Part 2) Cl. No. 17.2	Up to 100%

**Ravi Johri**  
Convenor

**Alok Jain**  
Program Manager

Laboratory TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7936

Page 12 of 13

Validity 26.09.2018 to 25.09.2020

Last Amended on 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
		Tensile Strength and Elongation at Break on Insulation & Sheath	IS 10810 (Part 7) IS 1554 (Part 1) Cl. NO. 15.1.d.1 IS 1554 (Part 2) Cl. No. 18.1.d.1	0.1 N to 2500 N Up to 800 %
		Insulation Resistance	IS 10810 (Part 43) IS 1554 (Part 1) Cl. No. 15.1.e IS 1554 (Part 2) Cl. No. 18.1.e	2 MΩ to 20 GΩ At 100 to 1000 Vdc
		Volume Resistivity	IS 1554 (Part 1) IS 5831 IS 10810 (Part 43) IS 1554 (Part 2) Cl. No. 18.1.e	Up to 10 <sup>17</sup> Ωcm
6.	Low Carbon Galvanized Steel Wires, Formed Wires and Tapes for armouring	Dimension & Tolerances	IS 3975 Cl. No. 7.3 Table-4	0.01 mm to 150 mm Needle pointed micrometer 0.01 mm to 25 mm
		Tensile Strength & Elongation	IS 1608 Cl. No. 8.1 Table-5	1N to 50KN Up to 20%
		Wrapping	IS 1755 IS 3975 Cl. No. 8.3	Qualitative
		Adhesion	IS 3975 Cl. No. 9.3	Qualitative
		Freedom from Defects	IS 3975 Cl. No. 11.0	Qualitative
		Resistance Test (for round and formed wires only)	IS 10810 (Part 42) IS 3975 Cl. No. 8.4	Up to 17 x 10 <sup>-6</sup> Ωcm
		Average mass of Zinc Coating	IS 6745 Cl. No. 9.1 (B)	Up to 600 gm/m <sup>2</sup>
		Uniformity of Zinc Coating	IS 2633 Cl. No. 9.2 (B)	Qualitative
7.	PVC Insulated & Sheathed Cables, Conduits etc.	Anti Rodent & Termite Repulsion	AAI Specification	Qualitative

Ravi Johri  
Convenor

Alok Jain  
Program Manager

Laboratory TVS Labs, 1/488-504, IInd Floor, Damodar Park, Dilshad Garden Industrial Area, Delhi

Accreditation Standard ISO/IEC 17025: 2005

Certificate Number TC-7936

Page 13 of 13

Validity 26.09.2018 to 25.09.2020

Last Amended on 18.03.2019

Sl.	Product / Material of Test	Specific Test Performed	Test Method Specification against which tests are performed	Range of Testing / Limits of Detection
III.	<b>TRANSMISSION LINE EQUIPMENT &amp; ACCESSORIES</b>			
1.	<b>Aluminium Conductor for Over Head Transmission Purpose</b>	Diameter of aluminium wire	IS 398 (Part 1)	0.001 mm to 25 mm/ 0.001 mm
		Breaking Load Test of individual aluminium wire	IS 398 (Part 1)	2 N to 50 kN/ 2N
		Wrapping test of aluminium wire	IS 398 (Part 1)	Qualitative
		Resistance Test of Aluminium Wire	IS 398 (Part 1)	0.2 $\mu\Omega$ to 11 $\Omega$ / 0.2 $\mu\Omega$
2.	<b>Aluminium Conductors for Overhead Transmission Purposes- Aluminium Conductors, galvanized steel-reinforced</b>	Measurement of lay ratio	IS 398 (Part 1)	8 to 20
		Diameter of individual aluminium and steel wires	IS 398 (Part 2)	0.001 mm to 25 mm/ 0.001 mm
		Measurement of Lay Ratio	IS 398 (Part 2)	8 to 20
		Breaking Load of individual wires	IS 398 (Part 2)	2 N to 50 kN/ 2 N
		Ductility Test (Elongation %)	IS 398 (Part 2)	1 mm to 1000 mm/ 1mm Upto 300 %
		Wrapping Test	IS 398 (Part 2)	Qualitative
		Torsion Test	IS 398 (Part 2)	Qualitative
		Resistance Test	IS 398 (Part 2)	0.2 $\mu\Omega$ to 11 $\Omega$ / 0.2 $\mu\Omega$
3.	<b>Aluminium Alloy Strand Conductor</b>	Galvanizing Test	IS 398 (Part 2)	0.0001 g to 200 g/ 0.0001g Upto 600 g/m <sup>2</sup>
		Breaking Load	IS 398 (Part 4)	2 N to 50 kN/ 2 N
		Elongation	IS 398 (Part 4)	1 mm to 1000 mm/ 1mm Upto 300 %
		Resistance	IS 398 (Part 4)	0.2 $\mu\Omega$ to 11 $\Omega$ / 0.2 $\mu\Omega$
		Calculated Breaking Load of Conductor	IS 398 (Part 4)	2 N to 50 kN/ 2 N

Ravi Johri  
Convenor

Alok Jain  
Program Manager