

इंटरनेट

मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

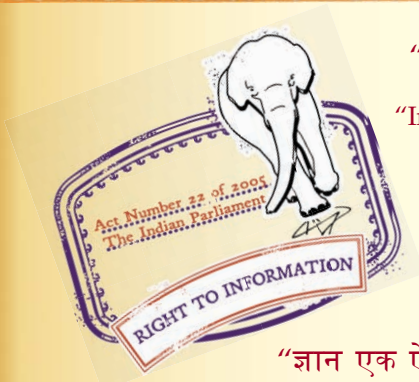
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 10810-10 (1984): Methods of test for cables, Part 10:
Loss of mass test [ETD 9: Power Cables]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

METHODS OF TEST FOR CABLES

PART 10 LOSS OF MASS TEST

1. Scope — Covers a method to determine the thermal effect on the mass of thermoplastic insulation and sheath.

2. Significance — Thermoplastic insulation and sheath exposed to heat are subjected to many types of physical and chemical changes. The severity of exposures, in both time and temperature, determines the extent and type of change that takes place. Extended periods of exposure of insulation and sheath to elevated temperatures will generally cause some degradation with progressive changes. These changes are assessed by measuring the loss of mass on subjecting the material to accelerated ageing.

Note — The method does not predict the thermal ageing characteristics together with interaction of mechanical and electrical stresses, environmental ageing to which the cable is subjected to, during service.

3. Terminology — Loss of mass, due to the ageing treatment, is expressed as ' difference in mass ' per unit surface area.

4. Apparatus

4.1 Oven — Electrically operated and thermostatically controlled heating cabinet (oven) with controlled air flow (see IS : 6365-1971 Specification for laboratory electric ovens). The air shall enter the oven in such a way that it flows over the surface of the test pieces and leaves near the top of the oven. The oven shall have a rate of air flow ensuring 8 to 20 changes per hour at specified ageing temperature.

4.2 Recording Instrumentation — To monitor the temperature in the oven.

4.3 Weighing Balance — Least count 0.2 mg.

4.4 Suitable Tube — Of approximate 100 mm dia and 300 mm length.

4.5 Stamping Dies — In accordance with 4.1 of IS : 10810 (Part 7)-1984 ' Methods of test for cables: Part 7 Tensile strength and elongation at break of thermoplastic and elastomeric insulation and sheath '.

5. Material — No material other than the test specimen is required.

6. Test Specimen

6.1 Test specimen details given in 6 of IS : 10810 (Part 7)-1984 shall be applicable, with the following exceptions:

- Dumb bell test specimens shall have two parallel surfaces over the whole length, their thickness shall be 1.0 ± 0.2 mm.
- In case of tubular test specimens, the total surface area (A) of each specimen (see 10) shall be not less than 5 cm².
- Flat twin flexible cords provided with a groove on both sides between the insulated cores shall be tested without separation of cores. For calculation of its surface of evaporation, the twin cord may be considered as being two separate tubular pieces.
- Marker lines are not required to be applied.

6.2 Number of Specimens — Three.

7. Conditioning — No pre-conditioning is required for this test.

8. Procedure

8.1 Surface area of each test specimen shall be determined in accordance with 10 and each test specimen shall be weighed accurately, in milligrams.

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8.2 The specimen shall then be suspended in the tube. Each specimen shall be at least 20 mm away from any other specimen and from the well of the tube. No other test specimen of different compound shall be exposed in the tube at the same time.

The tube shall be suspended vertically in the oven at a temperature and for a duration as specified in relevant specification. Not more than 0.5 percent of the oven volume shall be occupied by test specimens.

8.3 After this heat treatment, the specimen shall be cooled to room temperature and weighed again.

9. Tabulation of Observations

<i>Specimen Number</i>	<i>Surface Area A</i> cm ²	<i>Mass Before Ageing W₁</i> mg	<i>Mass After Ageing W₂</i> mg
1			
2			
3			

10. Calculation

10.1 Surface Area

a) For tubular specimens

Surface area A = Outer surface + inner surface + cut surface

$$A = \frac{2\pi (D-t) \times (L+t)}{100} \text{ cm}^2$$

where

t = mean value of thickness of test specimen, in millimetres, to two decimal places for values up to and including 0.4 mm and to one decimal place above this limit.

D = mean value of outer diameter of test pieces, in millimetres, to two decimal places for values up to and including 2 mm and to one decimal place above this limit.

L = length of test specimens in millimetres, to one decimal place.

Both t and D are measured on a thin slice cut from the end of each tubular test specimen [see IS : 10810 (Part 6)-1984 Methods of test for cables : Part 6 Thickness of thermoplastic and elastomeric insulation and sheath]. In case of sheaths of flat cables and cords, the inner and outer surfaces of evaporation shall be calculated from the dimensions of the cross-section of sheath, determined in millimetres, to two decimal places. The inner side of flat sheaths having a wedge shaped ridge may be considered as being flat for this purpose.

b) For standard dumb bell test specimen [see Fig. 1 of IS : 10810 (Part 7)-1984] :

$$A = \frac{1256 + (180t)}{100} \text{ cm}^2$$

c) For smaller dumb bell test specimen [see Fig. 2 of IS : 10810 (Part 7)-1984] :

$$A = \frac{624 + (118t)}{100} \text{ cm}^2$$

where t is the mean thickness of the strips, in millimetres to two decimal places.

10.2 Loss of mass of specimen, mg/cm² = $\frac{W_1 - W_2}{A}$.

10.2.1 The median value of the results from each core, shall be taken as the loss of mass.

11. Report**11.1 Loss of Mass Test for Insulation and Sheath**

Cable Type

Batch No./Lot No.

Cable No./Drum No.

11.2 Results

Reference Specification _____

Specimen Number	Loss of Mass, mg/cm ²	
	Observed	Specified

11.3 Conclusion — The specimen meets/does not meet the requirements of the specification.