IS 10810-11 (1984): Methods of test for cables, Part 11: Thermal aging in air [ETD 9: Power Cables]

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(First Reprint MARCH 1998)

UDC 621·315·221·8 : 621·315·616·9 [678·073 / ·074] : 620·193·918·2

IS : 10810 (Part 11) - 1984
(Reaffirmed 1996)

Indian Standard (Reaffirmed 2001)

METHODS OF TEST FOR CABLES

PART 11 THERMAL AGEING IN AIR

Power Cables Sectional Committee, ETDC 59; Panel for Methods for Cables, ETDC 59/P1 [Ref : Doc : ETDC 59 (2240)]

1. Scope — Covers a method for thermal ageing test in air of insulation and sheath of electric cables.

2. Significance — Thermoplastic and elastomeric 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. This test makes an assessment of change in tensile strength and elongation of materials on subjecting them to accelerated ageing in air.

3. Terminology — *See* 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'.

4. Apparatus — As given in **4.1** and **4.2**, in addition to those in IS : 10810 (Part 7)-1984.

4.1 *Oven* — As stipulated in **4.1** of IS : 10810 (Part 10)-1984 'Methods of test for cables : Part 10 Loss of mass test'.

4.2 Recording instrument to monitor the temperature in oven (thermometer, 200°C, least count 1°C).

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. Specimens shall be taken, preferably from positions close to that from which specimens for test without ageing are taken.

6.2 *Number of Specimens* — Four in each case of insulation or sheath, in addition to those required for testing without ageing.

7. Conditioning — No preconditioning is required for this test.

8. Procedure

8.1 Test for tensile strength and elongation at break shall be carried out on four specimens (without ageing) of insulation or sheath in accordance with IS : 10810 (Part 7)-1984, if the results of that test are not available otherwise.

8.2 Other four test specimens shall be suspended vertically and substantially in the middle of the oven so that each piece is at least 20 mm from any other piece.

8.3 The test specimens shall be kept in the oven at a temperature and for the time specified in the relevant specification.

8.4 At the end of ageing period, test specimens shall be taken out of oven and left at ambient temperature avoiding direct sunlight, for at least 16 h. Test for tensile strength and elongation at break shall, then be carried out in accordance with IS : 10810 (Part 7)-1984.

9. Tabulation of Observations

Specimen No.	*Cross-Sectional Area (A)* mm^2	*Tensile Strength* N/mm^2		*Elongation, Percent*	
		Before Ageing (T_1)	After Ageing (T_2)	Before Ageing (E_1)	After Ageing (E_2)

Adopted 14 March 1984

Gr 1

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10. Calculation

10.1 Tensile strength and elongation at break, before and after ageing shall be calculated as given in IS : 10810 (Part 7)-1984.

10.2 Tensile strength variation (difference between median value after ageing and median value before ageing, expressed as a percentage of the latter) $= \frac{T_1 - T_2}{T_1} \times 100$

10.3 Elongation variation, percent $= \frac{E_1 - E_2}{E_1} \times 100$

11. Report

11.1 *Reference Specification* _____

Specimen No.	*Tensile Strength Variation*		*Elongation Variation*	
	Observed	Specified	Observed	Specified

11.2 *Conclusion* — Specimen meets/does not meet the requirements of specification.