IS 10810-49 (1984): Methods of Test for Cables, Part 49: Heating Cycle Test [ETD 9: Power Cables]

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UDC 621·315·21 : 620·193·94

Indian Standard

(Reaffirmed 2001)

METHODS OF TEST FOR CABLES

PART 49 HEATING CYCLE TEST

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

1. Scope — Covers the method of heating cycle test of electric cables.

2. Significance

2.1 In actual service a cable undergoes cyclic heating and cooling resulting in the expansion and contraction of the cable. This expansion and contraction may cause either mechanical displacement/distortion or degradation of the screening materials if they are not properly bonded to the dielectric. This displacement/distortion or degradation of screens can cause ultimate failure of the cable by the initiation of vicious discharges or high dielectric losses. This test is a simulated test to check the performance of the cable under simulated service condition.

2.2 This test does not indicate the inherent property of the material but checks the adequacy of the manufacturing techniques.

3. Terminology

3.1 *See* IS : 1885 (Part 32) - 1971 ' Electrotechnical Vocabulary : Part 32 Cables, conductors and accessories for electricity supply' and IS : 4486 - 1967 ' Recommended methods for determination of the permitivity and dielectric dissipation factor of electrical insulating materials at power, audio and radio frequencies including metre wavelengths '.

3.2 The definitions covered by Power Factor Test and Partial Discharge Test shall also apply (*see* Parts 46 and 48 of this standard).

4. Apparatus

4.1 *Current Loading Transformers* — With associated control gears and measuring equipment.

4.2 *Temperature Measuring Instrument* — 0 to 100°C.

4.3 *Equipment as Required for Partial Discharge Test and Dielectric Power Factor Test*

5. Material — No material other than the specimen is required except certain necessary materials for making end terminations.

6. Test Specimen — A minimum length of 10 m of the cable shall constitute the sample. The ends shall be suitably prepared.

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

8. Procedure

8.1 The sample of cable is laid out on the floor of the test enclosure and the conductors connected to the current loading transformer and thermometers are connected suitably to the conductor surface to measure the conductor temperature.

8.2 The cable is to be gradually heated by passing current so that the conductor temperature reaches 10°C above the maximum continuous operating temperature of the cable. For multicore cables, the heating current shall be passed through all conductors. This heating shall be applied for at least 2 h, followed by at least 4 h of natural cooling in air.

8.3 This cycle shall be repeated twice more.

8.4 After the third cycle, the sample shall be subjected to the tests as specified in relevant cable specification.

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9. Tabulation of Observations

Sample No.	*Cable Description*	*Length*	*Ambient Temperature*	*Duration*		*No. of Heating Cycles*	*Conductor Temperature*	*Results of Subsequent Tests*
				Heating	Cooling			
		m	°C	h	h		°C	

10. Calculation — No calculation is involved.

11. Report

11.1 *Reference Specification*_____

Sample No.	*Number of Heating Cycles*	*Results of Tests Subsequent of Heat Cycles*

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

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