IS 10810-55 (1986): Methods of test for cables, Part 55: Abrasion test [ETD 9: Power Cables]

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Indian Standard

METHODS OF TEST FOR CABLES

PART 55 ABRASION TEST

Power Cables Sectional Committee, ETDC 59; Panel for Methods of Tests for Cables, ETDC 59/P1 [Ref : Doc : ETDC 59 (2240/55)]

1. Scope — Covers test method for assessing the resistance of extruded outer sheath of armoured cables to abrasive wear.

2. Significance — Cables during laying are subjected to abrasive wear and the performance of the cables in service depends on the integrity of the extruded sheath against this wear. The purpose of this test is to ascertain that the extruded outer sheath withstands abrasion during the laying operation.

3. Terminology — As given in IS : 1885 (Part 32)-1971 'Electrotechnical vocabulary: Part 32 Cables, conductors and accessories for electricity supply'.

4. Apparatus

4.1 *Mild Steel Angle* — Approximately 500 mm long, with outer radius of curvature of the angle edge not less than 1 mm and not greater than 2 mm.

4.2 *Adjustable Vertical Loading Arrangement* — Force varying from 65 to 550 N.

4.3 *DC High Voltage Source*

4.4 *Equipment* — Suitable for movement of the steel angle (*see* **8.3**).

5. Material — Solution of sodium-chloride, 0·5 percent by weight, containing 0·1 percent by weight of a suitable non-ionic surface active agent.

6. Test Specimen

6.1 Approximately 5 m length of cable shall constitute the test specimen.

6.2 *Number of Specimens* — One.

7. Conditioning — Test specimen shall be submitted to the bending operation given in the bending test as specified in the relevant standard.

8. Procedure

8.1 The specimen shall be laid out straight and horizontal with the plane of the previous bending operation in the horizontal plane on a firm base. Mild steel angle shall be placed horizontally in the middle part of the specimen with its angle edge resting on the cable and with its arms symmetrical above the vertical plane through the longitudinal axis of the cable as shown in Fig. 1.

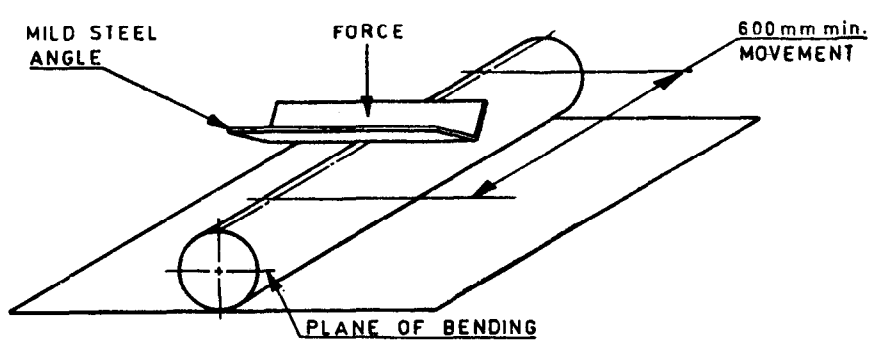

FIG. 1 ABRASION TEST ARRANGEMENT

Adopted 17 March 1986 | | Gr 1

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8.2 The steel angle shall be vertically loaded, above the point of contact, with a force in accordance with Table 1.

TABLE 1 VERTICAL FORCE ON STEEL ANGLE

Measured Overall Diameter of Cable		Force
Including and Above	Below	
mm	mm	N
—	40	65
40	50	106
50	60	155
60	70	210
70	80	270
80	90	340
90	100	420
100	110	500
110	—	550

8.3 The steel angle shall be dragged horizontally along the specimen for a distance not less than 600 mm at a speed between 150 and 300 mm/s. The direction of movement shall be reversed at the end of each pass to give 50 passes, 25 in each direction over the 600 mm test path.

8.4 After this, the mid part of the cable specimen shall be submerged in sodium chloride solution at ambient temperature.

8.5 After at least 24 hours of immersion, a dc voltage equal to 9 kV/mm of nominal sheath thickness shall be applied for a period of one minute between the saline solution and the metal layer which shall be at negative polarity.

8.6 The specimen shall be taken out from the saline solution. The extruded outer sheath shall be removed from specimen for 1 m, which includes the abraded area, employing two longitudinal cuts which do not pass through the conditioned area.

8.7 The outer sheath shall be cleaned of foreign material and shall be examined with unaided vision for cracks or splits in the internal and external surfaces.

9. Tabulation of Observations

Specimen No.	*Overall Diameter of Cable* mm	*Vertical Force on Steel Angle* N	*Voltage Breakdown of Sheath*	*Presence of Cracks/Splits*
			Yes/No	Yes/No

10. Calculation — No calculation is involved.

11. Report

11.1 *Cable Type*

11.2 *Reference Specification*_____

Type of Observation	*Observed*	*Specified*
Voltage breakdown of sheath	Yes/No	
Presence of cracks/splits	Yes/No	

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

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