IS 10810-41 (1984): Methods of test for cables, Part 41: Mass of zinc coating on steel armour [ETD 9: Power Cables]

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"पुनर्वष्ट १९९६"

(Reaffirmed 2001)

METHODS OF TEST FOR CABLES

PART 41 MASS OF ZINC COATING ON STEEL ARMOUR

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

1. Scope — Covers method for determination of mass of zinc coating on galvanized mild steel wires, strips and tapes of armour for electric cables.

2. Significance — Steel armours are galvanized to prevent rusting. This test is carried out to ascertain whether requisite amount of zinc has been deposited on the material by finding the mass of the zinc coating.

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

4. Apparatus

4.1 *Weighing Balance* — Least count 0·01 g.

4.2 *Breaker* — Capacity 500 ml with a watch glass.

4.3 *Micrometer* — Least count 0·01 mm.

5. Material

5.1 *Antimony Chloride Solution* — Obtained by dissolving 20 g of antimony trioxide or 32 g of antimony trichloride in one litre of concentrated hydrochloric acid.

5.2 *Concentrated Hydrochloric Acid* — Specific gravity 1·16, conforming to IS : 265-1976 ' Specification for hydrochloric acid '.

5.3 *Stripping Solution* — Obtained by adding and mixing well 5 ml of the antimony chloride solution (*see* **5.1**) to every 100 ml hydrochloric acid.

6. Test Specimen

6.1 The sample length of the wire/strip/tape shall be cut from one or both ends of the coil under test. Portions of wires/strips/tapes which are obviously damaged shall not be used as sample.

6.2 The length of the sample shall be not less than 250 mm. In case of smaller sizes of wire, mass of the sample in grams shall be not less than the diameter of the wire in millimetres multiplied by four as a guide to the length of wire.

7. Conditioning — The temperature of the stripping solution shall not exceed 38°C.

8. Test Procedure

8.1 The sample shall be cleaned in a suitable organic solvent, for example trichloroethylene, then with rectified spirit and finally dried thoroughly.

8.2 *Stripping* — Weigh the specimens (wires/strips/tapes) separately to the nearest 0·01 g and immerse separately in any convenient volume of the stripping solution until the evolution of hydrogen ceases. Take out the test specimen, wash in running water, wipe off well with clean soft cotton cloth, dry it fully and weigh the stripped specimen to the nearest 0·01 g.

8.3 In case of wires, the diameter of the wire shall also be determined to the nearest 0·01 mm by taking the average of two measurements at right angles to each other.

Note 1 — In case of wires/strips, the number of specimens immersed at any one time shall not exceed three for every 100 ml of the solution.

Note 2 — The same solution may be repeatedly used and without further addition of antimony chloride solution, until the time for stripping becomes inconveniently long.

Adopted 14 March 1984 Gr 1

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9. Tabulation of Observations

Specimen No.	*Mass of Original Sample (M_1)* g	*ass of Stripped Sample (M_2)* g	*Diameter of the Stripped Sample (d) (in Case of Wires Only)* mm

10. Calculation

10.1 Mass of zinc coating on wire, $g/m^2 = \frac{M_1 - M_2}{M_2} \times d \times 1\,965$

10.2 Mass of zinc coating on strips, $g/m^2 = \frac{M_1 - M_2}{M_2} \times K$

where

K = multiplying constant depending on the size of steel strip.

Note — For sizes covered at present in IS : 3975-1979 ' Mild Steel wires strips and tapes for armouring of cables ', constant K is as given below :

Dimensions in mm				*Constant K*
A	B	C	R	
4·0	3·4	0·8	10	2 571
6·1	5·3	1·4	27·5	4 383

10.3 Mass of zinc coating on tapes $g/m^2 = \frac{M_1 - M_2}{A} \times 10^6$

where

A = coated area of original test specimen (mm^2).

11. Report

11.1 *Reference Specification*_____

Specimen No.	*Size*	*Mass of Zinc Coating* g/m^2	
		Observed	Specified

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