

# इंटरनेट

# मानक

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IS 10810-64 (2003): Methods of Test for Cables, Part 64:  
Measurement of Temperature Index [ETD 9: Power Cables]



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“Knowledge is such a treasure which cannot be stolen”



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भारतीय मानक  
केबल की परीक्षण पद्धतियाँ  
भाग 64 तापमान सूचकांक का मापन

*Indian Standard*  
**METHODS OF TEST FOR CABLES**  
**PART 64 MEASUREMENT OF TEMPERATURE INDEX**

ICS 19.080:29.060.20

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**BUREAU OF INDIAN STANDARDS**  
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG  
NEW DELHI 110002

## FOREWORD

This Indian Standard (Part 64) was adopted by the Bureau of Indian Standards, after the draft finalized by the Power Cables Sectional Committee had been approved by the Electrotechnical Division Council.

This standard specifies the test method for measurement of temperature index of insulation or sheath of electric cables. This method is limited to physically self-supporting test specimens.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***METHODS OF TEST FOR CABLES****PART 64 MEASUREMENT OF TEMPERATURE INDEX****1 SCOPE**

This test method is applicable for testing the temperature index of insulation or sheath of electric cables and is limited to physically self-supporting test specimens.

**2 SIGNIFICANCE**

Oxygen index is the most widely used fire parameter in the assessment of materials. However, the burning is significantly influenced by the actual temperature involved. The temperature index helps in assessment of the material properties under heat and fire. It explores the temperature at which the oxygen index of a material becomes 21.

**3 REFERENCE**

The following standard is a necessary adjunct to this standard:

<i>IS No.</i>	<i>Title</i>
10810 (Part 58) : 1998	Method of test for cables: Part 58 Oxygen index test

**4 TERMINOLOGY****4.1 Temperature Index**

The temperature index is the temperature in °C at which the oxygen index of a material becomes 21 (the approximate percentage of oxygen in air) under the conditions of the test.

**5 APPARATUS**

The test apparatus is same as recommended for oxygen index test in IS 10810 (Part 58) with appropriate heating system.

**6 TEST SPECIMENS**

6.1 Three test specimens of flat rectangular sheets having the following dimensions:

Width	: $6.5 \pm 0.5$ mm
Thickness	: $3.0 \pm 0.5$ mm
Length	: 70 to 150 mm

NOTE — In case of flexible material, the thickness of specimen can be  $2.0 \pm 0.25$  mm instead of  $3.0 \pm 0.5$  mm.

6.2 Test the specimen in the condition as received unless otherwise agreed upon.

NOTE — Moisture content of some materials affect the oxygen

index. Conditioning at  $27 \pm 2^\circ\text{C}$  and  $50 \pm 5$  percent relative humidity for a minimum period of 40 h is recommended where a material is suspected to be affected by the retained moisture.

6.3 The specimens may be obtained by moulding, cutting or machining from those cable constituents to be tested. Where this is not possible with a cable containing vulcanized material, a moulded and vulcanized slab prepared from material sampled during manufacture of the same production batch shall be used.

6.4 The edges of the test pieces shall be smooth and free from fuse or burrs of material from machining or peripheral flash from moulding.

**7 PROCEDURE**

7.1 Place the thermocouple near the bottom to verify pre-heating air temperature and then position it near the top to determine the chimney temperature. Its position should be such, so as to avoid turbulence and shall not be subjected to heat from the burning specimen.

7.2 Record the ambient temperature. Adjust the gas flow in the chimney to  $4 \pm 1$  cm/s as calculated at standard temperature ( $0^\circ\text{C}$ ) and pressure (101.3 kPa) from the total flow of gas in  $\text{mm}^3/\text{s}$  divided by the area of the column in  $\text{mm}^2$ .

7.3 When the temperature is stable, clamp the specimen vertically by any small holding device, at its base in the approximate centre of the column with the top of the specimen at least 100 mm below the top of the open column. Re-adjust the thermocouple so as not to touch the specimen and be approximately 25 mm away from the centerline of the specimen.

7.4 Remove the thermocouple after the temperature has re-established (usually within 10 min) and determine the oxygen index of material at this temperature as per IS 10810 (Part 58).

7.5 Take the first reading at ambient temperature and continue repeating 7.1 to 7.3, however, raising the temperature in 7.2 by  $20^\circ\text{C}$  (maximum) for two successive determinations of values, for a total of minimum three different temperatures (including the reading at ambient temperature). The temperature index shall be determined by extrapolation of this data.

7.6 Plot values of oxygen index against temperature using linear graph paper and read off the value of temperature at which the oxygen index is 21.

8 TABULATION OF OBSERVATION

Sl No.	Test Temperature	Volumetric Flow Rate mm <sup>3</sup> /s			Specimen Burns	
		Oxygen	Nitrogen	Air	Duration (min)	≥ 50 mm (Yes/No)

9 CALCULATION

The minimum temperature index is the temperature at which the oxygen index is 21 read off in graph as per 7.6.

10 REPORT

10.1 Measurement of Temperature Index

Reference specification -----

Material under test .....

Ambient temperature .....

Specified temperature index .....

Observed temperature index .....

10.2 Conclusion

Specimen meets/does not meet the specification requirements.

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This Indian Standard has been developed from Doc: No. ET 09 (5184).

#### Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

#### BUREAU OF INDIAN STANDARDS

##### Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002  
Telephones: 2323 0131, 2323 3375, 2323 9402

Telegrams: Manaksanstha  
(Common to all offices)

##### Regional Offices:

	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{ 2323 7617 2323 3841
Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Kankurgachi KOLKATA 700054	{ 2337 8499, 2337 8561 2337 8626, 2337 9120
Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022	{ 60 3843 60 9285
Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113	{ 2254 1216, 2254 1442 2254 2519, 2254 2315
Western : Manakalaya, E9 MIDC, Marol, Andheri (East) MUMBAI 400093	{ 2832 9295, 2832 7858 2832 7891, 2832 7892
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