

# इंटरनेट

# मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

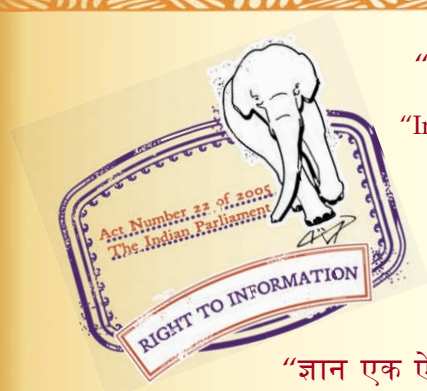
“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

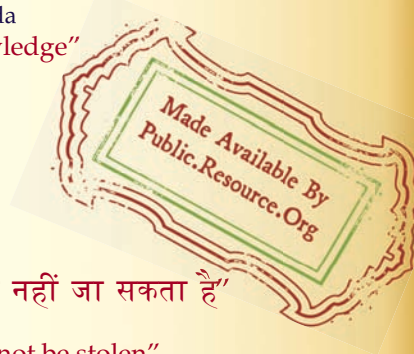
IS 10810-16 (1986): Methods of test for cables, Part 16:  
Accelerated ageing test by oxygen pressure method [ETD 9:  
Power Cables]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”



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## Indian Standard

## METHODS OF TEST FOR CABLES

PART 16 ACCELERATED AGEING TEST BY OXYGEN  
PRESSURE METHOD

**1. Scope** — Covers method of heat ageing test under oxygen pressure for insulation and sheath of electric cables.

**2. Significance** — This method is intended for use in estimating the relative resistance of vulcanised rubber to age deterioration by assessment of change in tensile strength and elongation of materials by subjecting them to accelerated ageing in oxygen.

### 3. Terminology

**3.1 Variation** — Difference between the median value obtained after ageing and the median value obtained without ageing expressed as a percentage of the latter. The values of the tensile strength and elongation at break obtained after ageing are expressed as the percentage of those obtained for the material not subjected to ageing.

**4. Apparatus** — As given below in 4.1, in addition to those required for tensile strength and elongation at break of insulation and sheath in accordance with IS : 10810 ( Part 7 )-1984 'Methods of test for cables : Part 7 Tensile strength and elongation at break of thermoplastic and electomeric insulation and sheath'.

**4.1 Oxygen Pressure Chamber ( Bomb )** — Shall consist of a metal vessel designed to retain an internal atmosphere of oxygen gas under pressure with provisions for placing rubber specimens within it and subjecting the whole to controlled uniform temperature. Because of the superior temperature control and heat transfer, metal vessels completely immersed in a liquid medium are recommended for the purpose of referee tests. The apparatus shall conform to the following requirements:

- The size of the chamber is optional but shall be such that the specimens may be suspended therein vertically without undue crowding and without touching each other or the sides of the chamber. They shall not occupy more than one tenth of the effective capacity of the chamber.
- The source of heat is optional but shall be located on the outside of the ageing chamber proper.
- The heating medium is optional. Water, air or other fluids known to be safe in the presence of oxygen may be used.
- Automatic temperature control of the heating medium by means of thermostatic regulation shall be used.
- The pressure chamber shall be equipped with a reliable safety valve or rupture diaphragm for release of over-pressure.

**5. Material** — Commercial oxygen, purity not less than 97 percent.

### 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** — Tests are made not before 24 hours after vulcanisation. Conditioning before subjecting specimens to tensile strength and elongation at break shall be in accordance with IS : 10810 ( Part 7 ) - 1984.

### 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.

## IS : 10810 ( Part 16 ) - 1986

**8.2** Other four test specimens shall be suspended in the chamber which shall be filled with oxygen at the specified pressure. The test specimens shall be kept in the chamber at the temperature for the time specified in the relevant specification.

**8.3** At the end of ageing period, the pressure shall be reduced gradually, so as to reach atmospheric pressure in not less than 5 minutes, in order to avoid formation of pores in the test specimens.

**8.4** Test specimens shall then, be taken out of chamber 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, mm <sup>2</sup> (A)	Tensile Strength, N/mm <sup>2</sup>		Elongation, percent	
		Before Ageing (T <sub>1</sub> )	After Ageing (T <sub>2</sub> )	Before Ageing (E <sub>1</sub> )	After Ageing (E <sub>2</sub> )

### 10. Calculations

**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, percent =  $\frac{T_1 - T_2}{T_1} \times 100$

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

### 11. Report

**11.1** Ageing Test Under Oxygen Pressure

**11.2** Reference Specification \_\_\_\_\_

Cable type \_\_\_\_\_

Batch No./Lot No. \_\_\_\_\_

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

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