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**SRI LANKA STANDARD 374 : 1976**

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**STANDARD ATMOSPHERIC  
CONDITIONS FOR  
CONDITIONING AND TESTING**

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BUREAU OF CEYLON STANDARDS**



# STANDARD ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING

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**COLOMBO 3.**

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This Standard does not purport to include all the necessary provisions of a contract.

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# SRI LANKA STANDARD ON STANDARD ATMOSPHERIC CONDITIONS FOR CONDITIONING AND TESTING

## FOREWORD

This Sri Lanka Standard has been prepared by the Drafting Committee on Standard Atmospheric Conditions for Conditioning and Testing. It was approved and authorised for adoption and publication by the Council of the Bureau on 7th January, 1976.

The properties of materials and behaviour of equipment under test are influenced by atmospheric conditions, such as the temperature, the relative humidity and the pressure of the ambient air at the time of the test. For comparison of test results obtained by different test laboratories/testing centres, it becomes necessary to specify standard atmospheric conditions and conditioning procedures, under which the test should be carried out or at which specimen should be conditioned before the test.

The principal considerations that would justify the adoption of a set of conditions may be enumerated in short as follows:

- (a) Temperature and humidity conditions specified should be suited to a majority of tests requiring standard atmospheric conditions;
- (b) Equipment required to maintain the standard conditions should be economical to install and easy to maintain; and
- (c) The standard conditions should be within the comfort zone for workers.

Although the necessity for having an internationally agreed set of standard atmospheric conditions for test is realized, the wide divergence of the atmospheric conditions in the temperate and tropical or sub-tropical regions indicate that the same test conditions may not be suitable for all the zones. This aspect was examined in great detail by the several technical committees of the International Organisation for Stan-

standardisation (ISO) and the International Electrotechnical Commission (IEC), and the Co-ordinating Committee on Atmospheric Conditions for Testing (ATCO) of ISO, in collaboration with IEC, has recommended the following three sets of standard atmospheric conditions from which the individual countries could choose whichever is most suitable to them:

- (a) 20°C with 65 per cent relative humidity
- (b) 23°C with 50 per cent relative humidity
- (c) 27°C with 65 per cent relative humidity

The atmosphere (c) above is intended for tropical and sub-tropical zones.

In most industrial testing, it is seldom necessary to control the atmospheric pressure as is done in the case of temperature and humidity. Tests are normally carried out at the prevailing atmospheric pressure. Tolerance limits for pressure, therefore, have different significance in different cases depending on the pressure sensitivity of the characteristic to be measured. It may, therefore, be necessary to specify the pressure tolerance in accordance with the needs of the situation in individual cases. In such cases correction factors shall also be specified.

It is realized that for many purposes the adoption of the primary international temperature, namely 30°C would have great advantages on the grounds of international comparability, for example, measurements of basic standard of length and mass, physical constants and precision measurements in terms of the basic standards as well as in such tests as the calibration of gauges, tools etc. It is desirable that in such cases as well as in other cases where international comparability is of prime importance the primary international temperature be adopted both for actually carrying out the test and for calculating the parameters when the test is carried out at the prevailing atmospheric conditions.

In the preparation of this standard considerable assistance obtained from publications of the Indian Standards Institution, International Organisation for Standardisation (ISO) and the International Electrotechnical Commission (IEC) is gratefully acknowledged.

## 1. SCOPE

This standard specifies the atmospheric conditions for conditioning and testing of materials, products, equipment, etc. and applies to such tests where atmospheric conditions need to be controlled to obtain comparable and reproducible results or to conduct measurements where test results obtained under different conditions have to be reduced to standard conditions.

## 2. GENERAL

**2.1** This standard does not apply to the basic standard of length and mass, to the precision measurement made in terms of these basic standards and to such tests as calibration of test gauges, precision tools, etc.

**2.2** This standard is not applicable in the following instances:

(a) Conditions for drying a material free from moisture and other solvents where a temperature of the order of the boiling point of the solvent and tolerances depending on the effect of temperature on the material shall have to be specified.

(b) Certain chemical and physical constants, such as specific gravity, refractive index and vapour pressure, may need be specified at temperatures other than the temperature of 27°C, for reasons such as non-availability of data and the desirability (from the technical point of view) of using a temperature other than the standard. In cases of non-availability of data, efforts should be made as far as possible to specify the constants on the basis of these standard conditions as the data become available, exceptional conditions being adopted in the interim period.

(c) Certain determinations, such as those of viscosity of liquids, plasticity of solids and density of materials, require much finer limits of tolerance than those required by this standard. In all such cases, suitable limits of tolerance shall be specified, but as far as possible the basic temperature should be retained at the standard value.

(a) Certain tests of specialized character which are intended to establish suitability of goods, materials, equipment, etc. for service under severe conditions, such as climatic tests on electrical and electronic components and equipment.

- 2.3** This standard is not applicable to cases where testing is done under the atmospheric conditions existing at the time and place where measurements are made (for example electric motors, generators, transformers) and where no question of controlled atmosphere arises.
- 2.4** For the conditioning of samples (of materials, components or equipment) prior to measurement, the length of time during which the sample is exposed to the conditioning atmosphere is of importance. This varies according to the nature of the sample being tested and is not dealt with in this standard.

### **3. TERMINOLOGY**

For the purpose of this standard, the following definitions shall apply:

- 3.1 Pre-conditioning**—The treatment of a sample of material, product or equipment with the object of removing or partly counteracting the effect of its previous history in respect, principally, to the temperature and humidity to which it has been exposed. This treatment usually precedes conditioning of the sample.
- 3.2 Conditioning**—The subjection of the sample to an atmosphere of a specified relative humidity, or complete immersion in water or other liquid, at a specified temperature for a specified period of time.

Note 1 — When the temperature and humidity for conditioning are the same as those prescribed for pre-conditioning, the pre-conditioning and conditioning may be merged and the pre-conditioning may be said to take the place of conditioning.

Note 2 — According to circumstances, the space used for measurement and conditioning may be a whole laboratory room in which the specified conditions are maintained within the prescribed tolerances, or a special test chamber.

- 3.3 Standard test atmosphere**—The atmosphere in which tests are conducted or to which the parameters are calculated.
- 3.4 Ambient atmosphere**—The atmosphere surrounding the sample of material or equipment to be tested.



- 3.5 Range of ambient atmospheric conditions**—The range of ambient atmospheric conditions within which measurements are made when no special atmospheric conditions are specified for measurements.

#### 4. STANDARD CONDITIONS

##### 4.1 Standard test atmosphere

- 4.1.1** The standard test atmosphere shall be;

Temperature 27°C  
 Relative humidity 65 per cent  
 Air pressure 101.3 kPa (760 mm Hg at 0°C)

Note — Wherever international comparability becomes necessary, the internationally accepted atmospheric conditions, for example, 20°C and 65 per cent relative humidity, may be adopted.

- 4.1.2** This atmosphere shall be used either for actually carrying out the test or for calculating the parameters when the tests are carried out at any other atmospheric conditions, the law of dependence of the parameter on temperature and/or humidity and/or pressure being known.

##### 4.2 Tolerances on Standard Test Atmosphere

Tolerances	Temperature	Relative humidity
	0°C	%
Ordinary (normal) tolerances	<u>+2</u>	<u>+5</u>
Reduced tolerances (closed tolerances)	<u>+1</u>	<u>+2</u>

**5. RANGE OF AMBIENT ATMOSPHERIC CONDITIONS  
FOR TESTING**

Wherever the parameters to be measured are not materially affected within a range of temperature and relative humidity it may not be necessary to carry out the measurements at the standard test atmosphere mentioned in Clause 4.1. In such cases the measurements may be carried out within the following range:

Temperature	15° to 35° C
Relative humidity	45 to 85 per cent
Air pressure	86.0 to 106.0 kPa

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The principal objects of the Institution as set out in the Act are to prepare standards and promote their adoption, to provide facilities for examination and testing of products, to operate a Certification Marks Scheme, to certify the quality of products meant for local consumption or exports and to promote standardization and quality control by educational, consultancy and research activity.

The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

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All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

In the International field the Institution represents Sri Lanka in the International Organization for Standardization (ISO), and participates in such fields of standardization as are of special interest to Sri Lanka.