
International Standard



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Rubber — Standard temperatures, humidities and times for the conditioning and testing of test pieces

Caoutchouc — Températures, humidités et durées normales pour le conditionnement et l'essai des éprouvettes

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Descriptors : rubber, test specimen, controlled atmospheres, test atmospheres.

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been authorized has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 471 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*.

This second edition was submitted directly to the ISO Council, in accordance with clause 6.11.2 of part 1 of the Directives for the technical work of ISO. It cancels and replaces the first edition (i.e. ISO 471:1977), which had been approved by the member bodies of the following countries :

| | | |
|----------------|-------------|----------------|
| Australia | Hungary | Spain |
| Belgium | India | Sweden |
| Brazil | Italy | Switzerland |
| Bulgaria | Mexico | Turkey |
| Canada | Netherlands | United Kingdom |
| Czechoslovakia | New Zealand | USA |
| France | Poland | USSR |
| Germany, F. R. | Romania | Yugoslavia |

No member body had expressed disapproval of the document.

Rubber — Standard temperatures, humidities and times for the conditioning and testing of test pieces

1 Scope and field of application

This International Standard specifies the time, temperature and humidity conditions used for the conditioning and testing of all types of rubber test pieces. Special conditions applicable to a particular test or material or simulating a particular climatic environment, are not included.

The conditioning treatment required for each individual test should be stated in the relevant test method.

NOTE — This International Standard takes cognisance of ISO 554, *Standard atmospheres for conditioning and/or testing — Specifications*.

2 Definition

For the purpose of this International Standard the following definition applies :

conditioning : Exposure of rubber to a standard temperature and relative humidity for a stipulated period of time immediately before testing, in order to improve the reproducibility of test results.

3 Temperatures and humidities to be used

3.1 Standard temperature

The standard temperature shall be either 23 °C or 27 °C, in accordance with national practice.

NOTE — 23 °C is normally the standard temperature in temperate countries and 27 °C is normally the standard temperature in tropical and subtropical countries.

3.2 Standard humidity

If control of temperature and humidity are necessary, the standard humidity shall be

50 % relative humidity at 23 °C, or

65 % relative humidity at 27 °C.

3.3 Other conditions

3.3.1 For use when standard temperature and humidity are not necessary :

Prevailing ambient temperature and humidity

NOTE — In certain cases, where there is a technical need due to the presence of a textile component, the combination of 20 °C and 65 % relative humidity may be used provided that this condition is clearly stated in the test report. (See ISO 139, *Textiles — Standard atmospheres for conditioning and testing*.)

3.3.2 For use when a subnormal or an elevated temperature is necessary :

Temperature or temperatures selected from the following preferred values :

- a) —80, —70, —55, —40, —25, —10,0 °C
- b) 40, 55, 70, 85, 100, 125 °C
- c) 150, 175, 200, 225, 250, 275, 300 °C

4 Tolerances

4.1 Temperature

For the temperatures specified in 3.1, the normal tolerance shall be ± 2 °C. If a closer tolerance is required for the temperatures specified in 3.1, it shall be ± 1 °C.

The average temperature of the environment shall be as close as practicable to the specified temperature.

4.2 Relative humidity

For the relative humidities specified in 3.2, the normal tolerance shall be ± 5 % relative humidity.

If a closer tolerance is required, it shall be ± 2 % relative humidity.

The average relative humidity of the environment shall be as close as practicable to the specified relative humidity.

5 Conditioning

5.1 When one of the temperatures and humidities specified in 3.1 and 3.2 is used, the standard time for conditioning shall be a period of not less than 16 h immediately before testing.

5.2 When one of the temperatures specified in 3.1 is used, the standard time for conditioning shall be a period of not less than 3 h immediately before testing.

5.3 When one of the temperatures specified in 3.3.2 is used, the test pieces shall be maintained at that temperature immediately before testing for a period of time sufficient to reach temperature equilibrium with the environment, or for the period of time required by the specification covering the material or product being tested.

5.4 The rubber test pieces shall be positioned during conditioning in such a manner that as far as possible the whole surface of each test piece is exposed.

NOTE — Attention is drawn to ISO 1826, *Rubber, vulcanized — Time-interval between vulcanization and testing — Specification*.

6 Testing

Unless otherwise specified, test pieces shall be tested at the same temperature and humidity at which they have been conditioned.

NOTE — Test pieces conditioned at one of the temperatures and humidities specified in 3.1 and 3.2 may be tested at the ambient condition specified in 3.3.1 in cases where the resulting changes of temperature and moisture content do not affect the test results.

7 Test report

The test report shall include the following information :

- a) temperature, or temperature and relative humidity, used for conditioning;
- b) tolerance on temperature and relative humidity used for conditioning;
- c) duration of conditioning;
- d) temperature, or temperature and relative humidity, used for testing;
- e) tolerance on temperature and relative humidity used for testing.

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