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**Rubber and plastics hoses and hose  
assemblies — Methods of measurement  
of the dimensions of hoses and the  
lengths of hose assemblies**

*Tuyaux et flexibles en caoutchouc et en plastique — Méthodes de  
mesurage des dimensions des tuyaux et de la longueur des flexibles*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 4671 was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Hoses (rubber and plastics)*.

This third edition cancels and replaces the second edition (ISO 4671:1999), which has been technically revised. The main changes are the following:

- a clause has been added (Clause 3) specifying details of test piece conditioning and temperature of measurement;
- in 4.2, the use of tapered gauges has been added;
- in Clause 4, an additional method of measuring the inside diameter has been included (4.8);
- in Clause 5, an additional method of measuring the outside diameter has been included (5.6);
- in 7.1, the parts of hoses at which readings are to be taken have been specified;
- in 8.1, the parts of the hoses at which readings are to be taken have been specified;
- in Clause 8, three additional methods of measuring the concentricity have been included (8.4, 8.5 and 8.6);
- in 9.2, the method of measuring the lining and cover thickness has been modified.

# Rubber and plastics hoses and hose assemblies — Methods of measurement of the dimensions of hoses and the lengths of hose assemblies

## 1 Scope

This International Standard specifies methods of measuring the inside diameter, outside diameter (including diameter over reinforcement of hydraulic hoses), wall thickness, concentricity and lining and cover thickness of hoses, methods of measurement and identification of the lengths of hoses and hose assemblies, and a method of verifying the through-bore of hydraulic hose assemblies.

## 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 463, *Geometrical Product Specifications (GPS) — Dimensional measuring equipment — Design and metrological characteristics of mechanical dial gauges*

ISO 3599, *Vernier callipers reading to 0,1 and 0,05 mm*

ISO 3611, *Micrometer callipers for external measurement*

## 3 Test piece conditioning and temperature of measurement

### 3.1 Conditioning of test pieces

Unless otherwise specified, test pieces shall be taken at least 16 h after manufacture of the hose and conditioned at  $23^{+7}_{-3}$  °C for at least 3 h before measurement. This 3 h may be included in the 16 h.

### 3.2 Measurement temperature

Unless otherwise specified, the measurement temperature shall be  $23^{+7}_{-3}$  °C.

## 4 Measurement of inside diameter

### 4.1 General

Measurements by methods 1 to 7 may be made either on the ends of a full length of hose or on a test piece (minimum length 150 mm) cut from a full length. For wire-reinforced hydraulic hoses, measurements shall be made at a minimum distance of 25 mm from the end of the hose.

Measurements shall be made using one of the following methods, as appropriate.