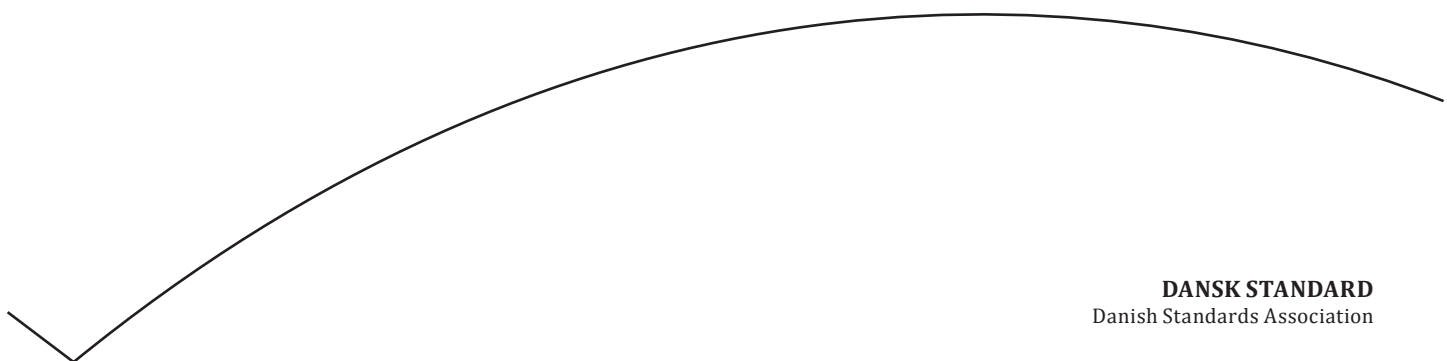


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# Slanger og rør af gummi og plast – Måling af fleksibilitet og stivhed – Del 1: Bøjeprøvning ved rumtemperatur

Rubber and plastics hoses and tubing – Measurement of flexibility and stiffness – Part 1: Bending tests at ambient temperature (ISO 10619-1:2017)



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DS projekt: M318577

ICS: 23.040.70

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EUROPÄISCHE NORM

March 2018

ICS 23.040.70

Supersedes EN ISO 10619-1:2011

English Version

## Rubber and plastics hoses and tubing - Measurement of flexibility and stiffness - Part 1: Bending tests at ambient temperature (ISO 10619-1:2017)

Tuyaux et tubes en caoutchouc et en plastique - Mesurage de la flexibilité et de la rigidité - Partie 1: Essais de courbure à température ambiante (ISO 10619-1:2017)

Gummi- und Kunststoffschläuche mit und ohne Einlage - Bestimmung der Biegsamkeit und Steifigkeit - Teil 1: Biegeprüfungen bei Umgebungstemperatur (ISO 10619-1:2017)

This European Standard was approved by CEN on 20 January 2018.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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## European foreword

This document ([EN ISO 10619-1:2018](#)) has been prepared by Technical Committee ISO/TC 45 “Rubber and rubber products” in collaboration with Technical Committee CEN/TC 218 “Rubber and plastics hoses and hose assemblies” the secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by August 2018, and conflicting national standards shall be withdrawn at the latest by August 2018.

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

This document supersedes [EN ISO 10619-1:2011](#).

According to the CEN-CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of [ISO 10619-1:2017](#) has been approved by CEN as [EN ISO 10619-1:2018](#) without any modification.

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Second edition  
2017-12-13

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# **Rubber and plastics hoses and tubing — Measurement of flexibility and stiffness —**

## **Part 1: Bending tests at ambient temperature**

*Tuyaux et tubes en caoutchouc et en plastique — Mesurage de la  
flexibilité et de la rigidité —*

*Partie : Essais de courbure à température ambiante*



Reference number  
ISO 10619-1:2017(E)

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

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Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This second edition cancels and replaces the first edition ([ISO 10619-1:2011](#)), of which it constitutes a minor revision. The changes compared to the previous edition are as follows:

- the unit used in the formula to calculate the flexural stiffness in [8.4](#) and [8.5](#) has been changed.

A list of all parts in the [ISO 10619- series](#) can be found on the ISO website.

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# Rubber and plastics hoses and tubing — Measurement of flexibility and stiffness —

## Part 1: Bending tests at ambient temperature

**WARNING** — Persons using this document should be familiar with normal laboratory practice. This document does not purport to address all of the safety problems, if any, associated with its use. It is the responsibility of the user to establish appropriate safety and health practices.

### 1 Scope

This document specifies three methods for measuring the flexibility of rubber and plastics hoses and tubing (methods A1, B and C1), where the deformation of the hose or tubing is measured, and two methods for measuring the stiffness (methods A2 and C2) by measuring the force required to bend rubber or plastics hoses or tubing to a specific radius at ambient temperature.

Methods A1 and A2 are suitable for rubber and plastics hoses and tubing with inside diameter of up to and including 80 mm.

Method A1 allows the measurement of the flexibility of the hose or tubing by measuring the reduction in outside diameter when the hose is compressed between two plates.

Method A2 provides a means of measuring the force required to reach a specific bend radius when the hose or tubing is compressed, as between two plates. The test can be carried out at a specified internal pressure.

Method B is suitable for rubber and plastics hoses and tubing with inside diameter of up to and including 100 mm, and provides a means of assessing the behaviour of the hose and tubing when bent around a mandrel. The final mandrel diameter used can be taken as the minimum bend radius of the hose or tubing. As this value is determined by the reduction of the outside diameter, it can be used as a measure of the flexibility of the hose or tubing. The hose or tubing being tested can be unpressurized, pressurized or under vacuum and, if required, with the curvature or against the curvature of the hose or tubing, if such curvature is present.

Methods C1 and C2 are suitable for rubber and plastics hoses and tubing with inside diameter of 100 mm and greater.

Method C1 provides a means of determining the flexibility of the hose and tubing at the minimum bend radius.

Method C2 provides a method of measuring the stiffness of the hose and tubing at the minimum bend radius.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 4671](#), *Rubber and plastics hoses and hose assemblies — Methods of measurement of the dimensions of hoses and the lengths of hose assemblies*

[ISO 8330](#), *Rubber and plastics hoses and hose assemblies — Vocabulary*

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[ISO 23529](#), *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*