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**BS EN ISO 7233:2016**



**BSI Standards Publication**

# **Rubber and plastics hoses and hose assemblies — Determination of resistance to vacuum (ISO 7233:2016)**

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This British Standard is the UK implementation of EN ISO 7233:2016. It supersedes BS EN ISO 7233:2008 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/66, Rubber and plastics tubing, hoses and hose assemblies.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Compliance with a British Standard cannot confer immunity from legal obligations.**

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English Version

## Rubber and plastics hoses and hose assemblies - Determination of resistance to vacuum (ISO 7233:2016)

Tuyaux et flexibles en caoutchouc et en plastique -  
Détermination de la résistance à l'aspiration (ISO  
7233:2016)

This European Standard was approved by CEN on 24 October 2016.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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.

CEN members are the national standards bodies of 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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## European foreword

This document (EN ISO 7233:2016) 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 April 2017, and conflicting national standards shall be withdrawn at the latest by April 2017.

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

This document supersedes EN ISO 7233:2008.

According to the CEN-CENELEC Internal Regulations, the national standards organizations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

### Endorsement notice

The text of ISO 7233:2016 has been approved by CEN as EN ISO 7233:2016 without any modification.

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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)).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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 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).

The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 1, *Rubber and plastics hoses and hose assemblies*.

This fourth edition cancels and replaces the third edition (ISO 7233:2006), which has been technically revised with the following changes:

- [Clause 11](#) has been re-written to clarify further on the minor axis measurement ( $D_2$  and  $D_3$ ) as shown in the new [Figure 2](#); as well as addition of a paragraph for examining interior and exterior of the hose;
- [Clause 12 f\)](#) has been re-written to include the observation that needs to be made for method C.

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## **Introduction**

Vacuum testing is applied to hoses to determine whether they will withstand the differential pressure encountered in service resulting from reduced pressure within the hose.

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# Rubber and plastics hoses and hose assemblies — Determination of resistance to vacuum

## 1 Scope

This document specifies three methods for determining the resistance to vacuum of hoses and hose assemblies manufactured from plastic or rubber. Applicable dimensions of hoses for each method are as follows:

- method A for hoses of nominal bore up to and including 80 mm;
- method B for hoses of nominal bore greater than 80 mm;
- method C for hoses of all dimensions.

Methods A and B can also be used to check the adhesion of the lining to the reinforcement (delamination) in a length of hard-wall hose or hose assembly.

## 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 4671:2007, *Rubber and plastics hoses and hose assemblies — Methods of measurement of the dimensions of hoses and the lengths of hose assemblies*

ISO 23529, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 8330 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

## 4 Principle

The test methodology for determining the resistance to vacuum of plastic and rubber hoses and hose assemblies consists of reducing the internal pressure in a length of hose by means of a vacuum pump and gauge, while examining the hose for any signs of deformation or delamination of reinforcement or lining.

## 5 Apparatus

**5.1 Vacuum pump**, provided with a gauge and capable of reducing the internal pressure in the hose within 60 s to the pressure specified in the product standard for the hose under test and maintaining it at that pressure for a minimum of 10 min.