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BSI Standards Publication

Rubber materials for seals and diaphragms for gas appliances and gas equipment

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National foreword

This British Standard is the UK implementation of EN 549:2019. It supersedes BS EN 549:1995, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee PRI/70, Elastomeric seals for joints in pipework and pipelines.

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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English Version

Rubber materials for seals and diaphragms for gas appliances and gas equipment

Matériaux à base de caoutchouc pour joints d'étanchéité et membranes destinés aux appareils à gaz et matériels pour le gaz

Elastomer-Werkstoffe für Dichtungen und Membranen in Gasgeräten und Gasanlagen

This European Standard was approved by CEN on 22 April 2019.

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.

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European foreword

This document (EN 549:2019) has been prepared by Technical Committee CEN/TC 208 "Elastomeric seals for joints in pipework and pipelines", 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of an identical text or by endorsement, at the latest by January 2020, and conflicting national standards shall be withdrawn at the latest by January 2020.

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 549:1994.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Regulation 2016/426 relating to appliances burning gaseous fuels.

For relationship with EU Regulation 2016/426, see informative Annex ZA, which is an integral part of this document.

The following main technical changes have been made compared to EN 549:1994:

- a) Clause 8, "Evaluation of life-time for material used to manufacture seals" added;
- b) Clause 9, "Infrared spectra of the material" added;
- c) resistance to condensate/liquid phase of combustible gases added;
- d) low temperature classes added;
- e) ozone resistance for diaphragms is now mandatory;
- f) informative Annex D added.

NOTE Verification of identity of material is described in the informative Annex D.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

This document specifies the requirements for rubber materials to be used for the manufacture of seals and diaphragms. It specifies for that purpose, tests to be carried out on standardized test pieces taken from sheets of material, since the small size of most components in general does not allow the preparation of necessary test samples for carrying out the complete range of tests.

It may be necessary to carry out supplementary tests on the component mounted in the gas appliance or in equipment, to confirm the functional suitability of the component. Such tests should be performed under the most severe service conditions envisaged in the appropriate standards for the gas appliances and/or equipment.

1 Scope

This document specifies requirements and associated test methods for rubber materials used in gas installations, gas equipment and gas appliances in contact with 1st, 2nd and 3rd family combustible gases as classified in EN 437:2018, additionally LPG, bio methane and bio LPG, in the same quality, are covered. It also establishes a classification based on temperature range and hardness. This document is applicable to materials from which homogeneous seals and homogeneous or reinforced diaphragms are manufactured.

Since the dimensions and shape of the components differ from those of standard test pieces taken from sheet material as used for type testing of the rubber materials according to this document, tolerances have been made in the requirements specified by Annex A for the components with respect to those specified for standard test pieces.

The range of operating temperatures covered by this document is $-40\text{ }^{\circ}\text{C}$ to $+150\text{ }^{\circ}\text{C}$.

For applications with potential condensation, this document is not applicable for silicon rubber, e.g. above 200 hPa (200 mbar) nominal pressure or at temperatures below $0\text{ }^{\circ}\text{C}$ with 3rd family gases.

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.

EN ISO 1183-1:2019, *Plastics - Methods for determining the density of non-cellular plastics - Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1:2019)*

ISO 37:2017, *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

ISO 48-2:2018, *Rubber, vulcanized or thermoplastic — Determination of hardness - Part 2: Hardness between 10 IRHD and 100 IRHD*

ISO 188:2011, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 815-1:2014, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

ISO 815-2:2014, *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 2: At low temperatures*

ISO 1407:2011, *Rubber — Determination of solvent extract*

ISO 1431-1:2012, *Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 1: Static and dynamic strain testing*

ISO 1817:2015, *Rubber, vulcanized or thermoplastic — Determination of the effect of liquids*

ISO 4650:2012, *Rubber — Identification — Infrared spectrometric methods*

ISO 23529:2016, *Rubber — General procedures for preparing and conditioning test pieces for physical test methods*