BRITISH STANDARD

BS EN
681-2:2000
*and 2 and*
*Corrigendum No. 1*



# Elastomeric seals — Materials requirements for pipe joint seals used in water and drainage applications —

## Part 2: Thermoplastic elastomers

The European Standard EN 681-2:2000, with the incorporation of amendments A1:2002 and A2:2005, has the status of a British Standard

ICS 23.040.80



BSI
British Standards

This British Standard is the official English language version of EN 681-2:2000, including amendments A1:2002 and A2:2005. Together with BS EN 682:2002, this publication supersedes BS 2494:1990 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ▌A1⟩ ⟨A1▐. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by ▌A1⟩ ⟨A1▐.

The UK participation in its preparation was entrusted to Technical Committee PRI/70, Elastomeric seals, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

**Cross-references**

The British Standards which implement international or European publications referred to in this document may be found in the *BSI Catalogue* under the section entitled "International Standards Correspondence Index", or by using the "Search" facility of the *BSI Electronic Catalogue* or of British Standards Online.

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

**Compliance with a British Standard does not of itself confer immunity from legal obligations.**

This British Standard, having been prepared under the direction of the Materials and Chemicals Sector Policy and Strategy Committee, was published under the authority of the Standards Policy and Strategy Committee on 15 September 2000

**Summary of pages**

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 20, an inside back cover and a back cover.

The BSI copyright date displayed in this document indicates when the document was last issued.

**Amendments issued since publication**

| Amd. No. | Date | Comments |
|---|---|---|
| 13837<br>Corrigendum No. 1 | 28 March 2002 | Addition of supersession details to national foreword |
| 13705 | 26 August 2002 | See national foreword |
| 15840 | 11 January 2006 | See national foreword |
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EUROPEAN STANDARD **EN 681-2**
**+ A1** **+A2**

EUROPÄISCHE NORM March 2002 August 2005

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English version

# Elastomeric seals – Materials requirements for pipe joint seals used in water and drainage applications – Part 2: Thermoplastic elastomers (includes amendments A1:2002 and A2:2005)

Garnitures d'étanchéité en caoutchouc – Spécification des matériaux pour garnitures d'étanchéité utilisées dans le domaine de l'eau et du drainage – Partie 2: Elastomères thermoplastiques (inclut les amendements A1:2002 et A2:2005)

Elastomer-Dichtungen – Werkstoff-Anforderungen für Rohrleitungs-Dichtungen für Anwendengen in der Wasserversorgung und Entwässerung – Teil 2: Thermoplastische Elastomere (enthält Änderungen A1:2002 und A2:2005)

This European Standard was approved by CEN on 3 June 2000. Amendment A1 was approved by CEN on 25 February 2002, Amendment A2 was approved by CEN on 14 July 2005.

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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

**Central Secretariat: rue de Stassart, 36 B-1050 Brussels**

 Ref. No. EN 681-2:2000 + A1:2002 + A2:2005 E

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## Foreword

This European Standard 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 2001, and conflicting national standards shall be withdrawn at the latest by January 2001.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

This part has been prepared in response to requests from CEN/TC 155 for a material specification for thermoplastic elastomer seals for use in conjunction with non-pressure thermoplastic pipe systems.

A European Standard will be prepared for microbiological deterioration requirements and when published it is intended that materials comply with the requirements of that standard.

It is recommended that third party inspection be carried out at least twice a year without previous notice, the assessment body complying with the requirements of EN 45011 and EN 45012 or equivalent.

Part 1 of this standard is based on ISO 4633 and ISO 9631, bringing these two sets of requirements (for cold and hot water respectively) under one specification. The major changes from ISO 4633 and ISO 9631 have been to incorporate requirements for effect on water quality and ozone resistance. The emphasis in respect of low temperature testing has moved away from hardness measurement to compression set, which is more discriminating.

Part 3 has been prepared in response to requests from those sections of the pipeline industry which employ cellular seals of vulcanized rubber.

Part 4 has been prepared in response to requests from those sections of the pipeline industry which employ cast polyurethane seals.

This standard should be used where appropriate with product standards which specify performance requirements for joints.

Seals and pipe joints using thermoplastic elastomers should be designed and tested to take into account the different requirements compared with those specified in Part 1 of this standard.

In accordance with the common CEN/CENELEC Rules member states are required to transpose the European Standard into a national standard no later than six months following its date of adoption (DOA) by the BT. At this time any existing national standards having the same scope are withdrawn (DOW).

Annex A is informative.

This document EN 681-2:2000/A1:2002 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 September 2002, and conflicting national standards shall be withdrawn at the latest by December 2003.

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 Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

**Foreword to amendment A2**

This document (EN 681-2:2000/A2:2005) 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 Amendment to the European Standard EN 681-2:2000 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by February 2006, and conflicting national standards shall be withdrawn at the latest by February 2006.

This document amends EN 681-2:2000 including amendment A1:2002.

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

This standard specifies requirements for materials used for moulded seals only of thermoplastic elastomers (TPE) used in joints of:

1) thermoplastic piping systems for non pressure waste water discharge (intermittent flow up to 95 °C) inside buildings;

2) thermoplastic piping systems for non-pressure underground drainage and sewerage (continuous flow up to 45 °C and intermittent flow up to 95 °C);

3) thermoplastic rainwater piping systems.

General requirements for finished joint seals are also given; any additional requirements called for by the particular application are specified in the relevant product standards taking into account that the performance of pipe joints is a function of the seal material properties, seal geometry and pipe joint design.

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

| | |
|---|---|
| ISO 37, | *Rubber, vulcanized or thermoplastic - Determination of tensile stress-strain properties* |
| ISO 48, | *Rubber, vulcanized or thermoplastic - Determination of hardness (hardness between 10 and 100 IRHD)* |
| ISO 188, | *Rubber, vulcanized - Accelerated ageing or heat-resistance tests* |
| ISO 471, | *Rubber - Temperatures, humidities and times for conditioning and testing* |
| ISO 815, | *Rubber, vulcanized or thermoplastic - Determination of compression set at ambient, elevated or low temperatures* |
| ISO 1431-1, | *Rubber, vulcanized or thermoplastic - Resistance to ozone cracking - Part 1: Static strain test* |
| ISO 1817, | *Rubber, vulcanized - Determination of the effect of liquids* |
| ISO 2859-1, | *Sampling procedures for inspection by attributes - Part 1: Sampling plans indexed by acceptable quality level (AQL) for lot-by-lot inspection* |
| ISO 3302-1, | *Rubber - Tolerances for products - Part 1: Dimensional tolerances* |
| ISO 3384:1999, | *Rubber, vulcanized or thermoplastic - Determination of stress relaxation in compression at ambient and at elevated temperatures* |