



BSI Standards Publication

Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials

National foreword

This British Standard is the UK implementation of [ISO 4633:2023](#).

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 committee manager.

Contractual and legal considerations

This publication has been prepared in good faith, however no representation, warranty, assurance or undertaking (express or implied) is or will be made, and no responsibility or liability is or will be accepted by BSI in relation to the adequacy, accuracy, completeness or reasonableness of this publication. All and any such responsibility and liability is expressly disclaimed to the full extent permitted by the law.

This publication is provided as is, and is to be used at the recipient's own risk.

The recipient is advised to consider seeking professional guidance with respect to its use of this publication.

This publication is not intended to constitute a contract. Users are responsible for its correct application.

© The British Standards Institution 2023
Published by BSI Standards Limited 2023

ISBN 978 0 539 17081 8

ICS 83.140.50; 91.140.60; 91.140.80

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

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 30 September 2023.

Amendments/corrigenda issued since publication

Date	Text affected
------	---------------

INTERNATIONAL STANDARD

ISO
4633

Fifth edition
2023-08-31

Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials

*Joints étanches en caoutchouc — Garnitures de joints de canalisations
d'adduction et d'évacuation d'eau (égouts inclus) — Spécification
des matériaux*



Reference number
ISO 4633:2023(E)
Documents
Document Sharing Hub
© ISO 2023



COPYRIGHT PROTECTED DOCUMENT

© ISO 2023, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification	2
5 Requirements	2
5.1 General	2
5.2 Effect on water quality	2
5.3 Microbiological deterioration	3
5.4 Dimensional tolerances	3
5.5 Imperfections and defects	3
5.6 Hardness	3
5.7 Tensile strength and elongation at break	3
5.8 Compression set in air	3
5.8.1 General	3
5.8.2 Compression set at 23 °C and 70 °C	4
5.8.3 Low-temperature compression set at –10 °C	4
5.9 Accelerated ageing in air	4
5.10 Stress relaxation in compression	4
5.11 Volume change in water	4
5.12 Ozone resistance	5
5.13 Splices of prevulcanized profile ends	5
5.13.1 Spliced joints	5
5.13.2 Strength of spliced joints	5
5.14 Summary of physical property requirements	5
6 Optional requirements	6
6.1 Low temperature performance at –25 °C, (type L)	6
6.2 Volume change in oil, (type O)	6
6.3 Lifetime estimation, (type LT)	6
6.3.1 General	6
6.3.2 Method 1 by stress relaxation	7
6.3.3 Method 2 by compression set	7
6.4 Summary of optional property requirements	7
7 Test pieces and test temperature	8
7.1 Preparation of test pieces	8
7.2 Test temperature	8
8 Quality assurance	8
9 Storage	8
10 Designation	8
11 Marking and labelling	9
Annex A (normative) Determination of splice strength	10
Annex B (informative) Quality assurance	11
Annex C (informative) Guidance on storage of seals	12
Annex D (informative) Remarks regarding the lifetime estimation in 6.3	13
Bibliography	14

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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

For an explanation of 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

This fifth edition cancels and replaces the fourth edition (ISO 4633:2015), which has been technically revised.

The main changes are as follows:

- estimation of lifetime and lifetime classes have been added as optional requirement;
- structural changes in the document.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Rubber seals — Joint rings for water supply, drainage and sewerage pipelines — Specification for materials

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 requirements for materials used in vulcanized rubber seals for the following:

- a) cold drinking-water supplies (up to 50 °C);
- b) drainage, sewerage, and rainwater systems (continuous flow up to 45 °C and intermittent flow up to 95 °C).

The different designations of seals specified are defined according to their type, application, and requirements (see [Table 5](#)).

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. This document is intended to be used, where appropriate, with product standards which specify performance requirements for joints.

This document is applicable to joint seals for all pipeline materials, including iron, steel, clay, fibre cement, concrete, reinforced concrete, plastics, and glass-reinforced plastics.

It is applicable to elastomeric components of composite or non-composite seals. In the case of composite seals for materials of hardness ranges from 76 IRHD-M to 95 IRHD-M, the requirements for elongation at break, compression set, and stress relaxation apply only when the material is participating in the sealing function or in the long-term stability of the seal.

Joint seals made with an enclosed void as part of their design are included in the scope of this document.

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 37](#), *Rubber, vulcanized or thermoplastic — Determination of tensile stress-strain properties*

[ISO 48-2](#), *Rubber, vulcanized or thermoplastic — Determination of hardness — Part 2: Hardness between 10 IRHD and 100 IRHD*

[ISO 188:2023](#), *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

[ISO 815-1:2019](#), *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 1: At ambient or elevated temperatures*

[ISO 815-2](#), *Rubber, vulcanized or thermoplastic — Determination of compression set — Part 2: At low temperatures*

[ISO 1431-1](#), *Rubber, vulcanized or thermoplastic — Resistance to ozone cracking — Part 1: Static and dynamic strain testing*