BS ISO 5892:2013

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Rubber building gaskets — Materials for preformed solid vulcanized structural gaskets — Specification

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National foreword

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INTERNATIONAL STANDARD

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Rubber building gaskets — Materials for preformed solid vulcanized structural gaskets — Specification

Profilés en caoutchouc pour le bâtiment — Matériaux pour profilés de structure compacts préformés vulcanisés — Spécifications

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Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
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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. www.iso.org/directives

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The committee responsible for this document is ISO/TC 45, *Rubber and rubber products*, Subcommittee SC 4, *Products (other than hoses)*.

This second edition cancels and replaces the first edition (ISO 5892:1981), which has been technically revised.

INTERNATIONAL STANDARD **ISO 5892:2013(E)**

Rubber building gaskets — Materials for preformed solid vulcanized structural gaskets — Specification

1 Scope

This International Standard specifies material requirements for preformed, solid vulcanized rubber structural gaskets in sealing and supporting applications for buildings.

NOTE Specifications for non-supporting gaskets are given in ISO 3934.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. 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 188, *Rubber, vulcanized or thermoplastic — Accelerated ageing and heat resistance tests*

ISO 812:2011, *Rubber, vulcanized or thermoplastic — Determination of low-temperature brittleness*

ISO 815-1, *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 1382, *Rubber — Vocabulary*

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

ISO 3302-1, *Rubber — Tolerances for products — Part 1: Dimensional tolerances*

ISO 3865, *Rubber, vulcanized or thermoplastic — Methods of test for staining in contact with organic material*

ISO 7619-1, *Rubber, vulcanized or thermoplastic — Determination of indentation hardness — Part 1: Durometer method (Shore hardness)*

ISO 15821, *Doorsets and windows — Water-tightness test under dynamic pressure — Cyclonic aspects*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1382 and the following apply.

3.1
structural gasket
building gasket that directly supports glasses, etc. and makes components watertight and airtight

Note 1 to entry: It consists of gaskets and lock strips.

3.2
gasket
component with channels which support both glasses and support frames

Note 1 to entry: Gaskets having two channels are called double-channel gaskets and those having one channel are called single-channel gaskets.

3.3
lock strip
component that is inserted into the lock-strip cavities for ensuring the required watertightness and airtightness

4 Types of material

Two types of materials are specified. Type E, with a nominal hardness of 75 Shore A, is intended for the gaskets and for the lock strip. Type F, with a nominal hardness of 85 Shore A, is intended only for the lock strip.

5 Working temperature range

The working temperature ranges of gaskets are divided into the following categories:

a) P_1: temperature of gasket: −20 °C to +55 °C;

b) P_2: temperature of gasket: −20 °C to +85 °C;

c) P_3: temperature of gasket: −40 °C to +70 °C;

d) P_4: temperature of gasket: −40 °C to +100 °C.

6 Material and workmanship

6.1 All materials and workmanship shall be in accordance with good commercial practice.

6.2 Gaskets shall be made from ozone-resistant rubber and shall not depend for ozone resistance solely on surface protection which can be removed by abrasion, detergents, or other means.

6.3 Gaskets shall be free from porosity, significant surface defects, and dimensional irregularities, particularly on the sealing faces.

7 Dimensions and tolerances

Dimensions shall be the subject of agreement between the interested parties. Tolerances shall be in accordance with the specifications of ISO 3302-1.

8 General requirements

8.1 Test pieces

Test pieces shall be cut from the finished product. If they cannot be so prepared, they shall be taken from moulded test slabs of suitable dimensions made from the same batch of material used for the gaskets and vulcanized under conditions which are comparable with the conditions used in production.

8.2 Hardness

When tested in accordance with the method specified in ISO 7619-1, the hardness shall comply with the requirements of Table 1.

8.3 Tensile strength and elongation at break

When tested in accordance with the method specified in ISO 37 using a dumbbell test piece, the tensile strength and elongation at break shall comply with the requirements of Table 1.

8.4 Compression set

When tested in accordance with the method specified in ISO 815-1, the compression set shall comply with the requirements of Table 1 after 24 h at 100 °C.

8.5 Accelerated ageing

After the test pieces have been aged in accordance with the method specified in ISO 188 and the conditions specified in Table 2, the change in hardness, tensile strength, and elongation at break shall comply with the requirements of Table 1.

8.6 Ozone resistance

When tested in accordance with the method specified in ISO 1431-1, test pieces shall show no cracks after 96 h at 40 °C, under 20 % elongation, at an ozone concentration of 500 ppb.

Table 1 — Property requirements

Property	Unit	Limit		Document specifying test method
		Type E	Type F	
Hardness	Shore A	75 ± 5	85 ± 5	ISO 7619-1
Tensile strength, min.	MPa	12	12	ISO 37
Elongation at break, min.	%	175	125	ISO 37
Compression set, after 24 h at 100 °C, max.	%	35	35	ISO 815-1
Ozone resistance 500 ppb; elongation 20 %; duration 96 h at 40 °C	—	No cracking	No cracking	ISO 1431-1
Maximum change from unaged values after ageing under conditions specified in Table 2:				
a) hardness	Shore A	+10 to 0	+10 to 0	ISO 188 and ISO 7619-1
b) tensile strength	%	−15	−15	ISO 188 and ISO 37
c) elongation at break	%	−40	−40	ISO 188 and ISO 37

Table 2 — Accelerated ageing test conditions

Working temperature range	Test temperature °C	Test time d
P_1	70	14
P_2	100	
P_3	85	
P_4	125	

9 Specific requirements

9.1 General

These requirements are optional. Requirements and corresponding test methods shall be the subject of agreement between the interested parties. Requirements specified in 9.2 to 9.8 are summarized in Table 3.

9.2 High-density ozone resistance

When tested in accordance with the method specified in ISO 1431-1, test pieces shall show no cracks after 96 h at 40 °C, under 20 % elongation, at an ozone concentration of 2 000 µg/m^3.

9.3 Holding force

Holding force should be measured according to the method described in Annex A. This method is given as an example. Details of the procedure and requirements depend on the profile of the gasket and shall be the subject of agreement between the interested parties.

9.4 Watertightness

A suitable test method is described in ISO 15821.

9.5 Flammability

The flammability of the material shall comply with the requirements of the national regulations regarding the structure of which it is a part.

9.6 Contact and migration staining

A suitable test method is described in ISO 3865.

9.7 Low-temperature brittleness

When tested in accordance with the method specified in ISO 812, procedure C, no failure shall be observed in any one of the test pieces at the lowest temperature in thermal conditions of use.

9.8 Low-temperature compression set

When tested in accordance with the method specified in ISO 815-2, the median value of type E compression set after recovery periods of 30 min shall be 80 % or less after 24 h at −25 °C. The median value of type F compression set after recovery periods of 30 min shall be 90 % or less after 24 h at −25 °C.

Table 3 — Summary of the specific property requirements

Property	Unit	Limit		Document specifying test method
		Type E	Type F	
High-density ozone resistance 2 000 µg/m^3; elongation 20 %; duration 96 h at 40 °C	—	No cracking		ISO 1431-1
Holding force	N/m	Agreement between interested parties		Annex A
Watertightness	—	Agreement between interested parties		ISO 15821
Flammability	—	Requirements of national regulations		National regulations
Contact and migration staining	—	Agreement between interested parties		ISO 3865

Table 3 *(continued)*

Property	Unit	Limit		Document specifying test method
		Type E	Type F	
Low-temperature brittleness	°C	Lowest temperature in thermal conditions of use or below		ISO 812, procedure C
Low-temperature compression set, after 24 h at –25 °C Median value after recovery period of 30 min	%	80 % or less	90 % or less	ISO 815-2

Annex A
(informative)

Holding force test

A.1 Principle

This test method determines the force exerted by the gaskets to hold glass, etc. It simulates actual use conditions by applying a load to the pressure plate, which is a simulated glass. In the case of double-channel gaskets, place the test pieces between the pressure plate and support frames with thickness equal to that of the articles. In the case of single-channel gaskets, attach the pressure plate and test pieces to the reglets and support frames. Thus, these measurements reflect the wind pressure that would be encountered during application.

A.2 Apparatus

A.2.1 The testing machine shall be a power-driven tensile testing machine of the movable crosshead type, equipped with adjustable crosshead speed control, a suitable dynamometer, and an indicating or recording device for measuring the applied force with an accuracy of ±2 % of the full-scale reading.

A.2.2 The pressure plate and support frames to be used with the testing machine shall be of a type similar to those shown in Figures A.1 and A.2. The thickness of the support frames and the groove dimensions of the reglets shall be subject to actual use conditions.

A.2.3 The pressure plate and support frames shall be made of steel. The reglets shall be made of steel or a material equivalent to that of the actual reglets. Their length shall be at least 100 mm.

A.3 Test piece

A.3.1 The extruded test pieces shall be at least 50 mm long but no longer than the pressure plate, support frames, and reglets.

A.3.2 A minimum of eight test pieces from each lot shall be tested.

A.4 Procedure

A.4.1 Place the test pieces in the support frames as shown in Figures A.1 or A.2. The clearance at this time shall be the subject of agreement between the interested parties. The test shall be conducted at a standard laboratory temperature.

A.4.2 Strain the pressure plate at a straining speed of 10 mm/min until the pressure plate or the gaskets come out of the reglets or support frames.

A.4.3 Read the maximum load from the automatic recording.

A.4.4 Repeat the operations in A.4.1 to A.4.3 until two sets of test pieces have been tested.

A.4.5 Change the loading direction to simulate the wind pressure from the outside and the inside of the chamber under actual use conditions. Repeat the operations in A.4.1 to A.4.3 until two sets of test pieces have been tested.

A.4.6 The holding force, W_P, is given by Formula (1):

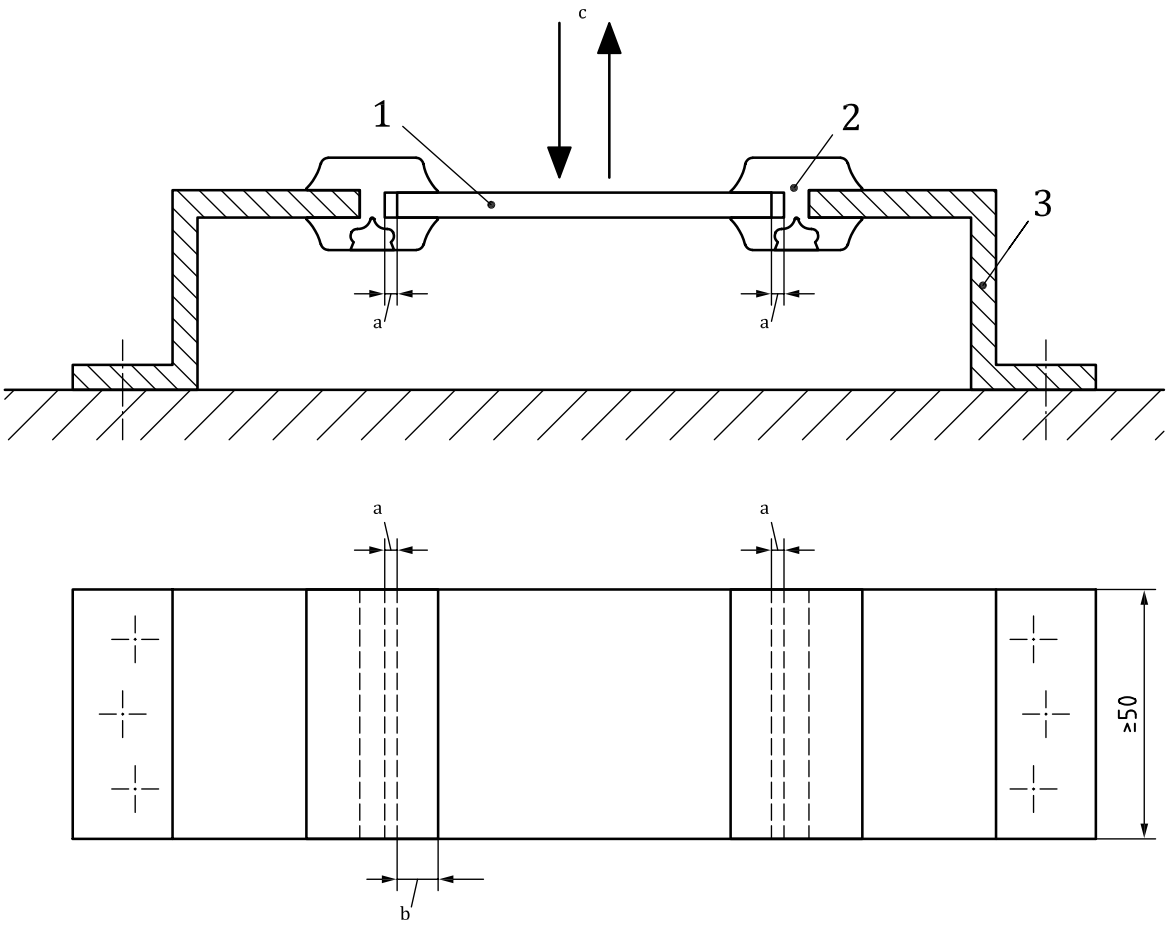
$$W_P = \frac{W}{L} \tag{1}$$

where

W is the maximum load, expressed in newtons;

L is the sum of length of specimens, expressed in millimetres.

Dimensions in millimetres

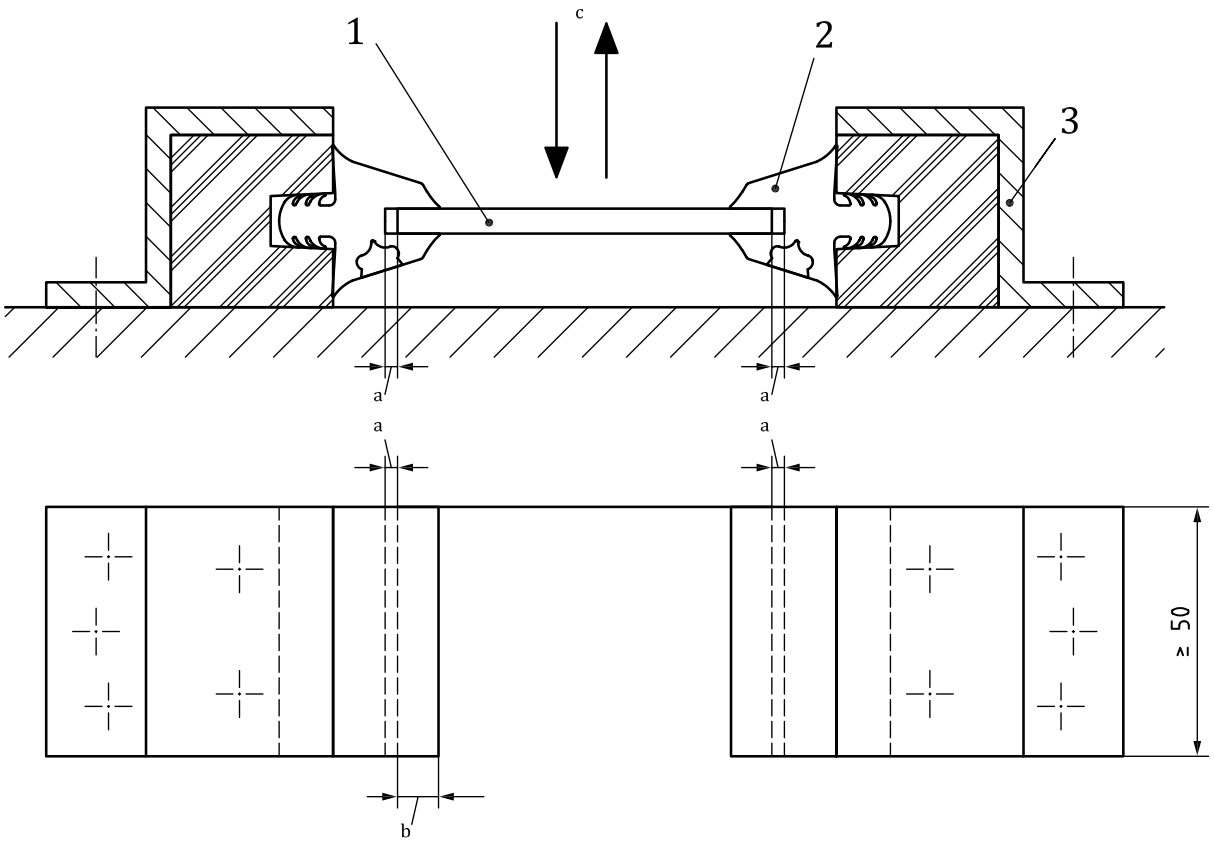


Key

1 pressure plate
2 H-shaped gasket
3 support frame
a Clearance.
b Bearing width.
c Load.

Figure A.1 — In the case of double-channel gasket

Dimensions in millimetres



Key

1 pressure plate
2 Y-shaped gasket
3 support frame
a Clearance.
b Bearing width.
c Load.

Figure A.2 — In the case of single-channel gasket

Bibliography

[1] ISO 3934, *Rubber, vulcanized and thermoplastic — Preformed gaskets used in buildings — Classification, specifications and test methods*

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