International Standard 5892

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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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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5892 was developed by Technical Committee ISO/TC 45, *Rubber and rubber products*, and was circulated to the member bodies in August 1979.

It has been approved by the member bodies of the following countries :

Belgium	Italy	Thailand
Canada	Mexico	Turkey
Czechoslovakia	Poland	United Kingdom
Denmark	Romania	USA
Egypt, Arab Rep. of	South Africa, Rep. of	USSR
Germany, F.R.	Spain	
India	Switzerland	

The member bodies of the following countries expressed disapproval of the document on technical grounds :

France
Hungary
Netherlands

Printed in Switzerland

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

1 Scope and field of application

This International Standard specifies material requirements for preformed, solid vulcanized rubber structural gaskets used in sealing applications where both resistance to stress relaxation and resistance to weathering are essential. It relates particularly to gaskets of the lock-strip type.

It does not give the material requirements for gaskets used for sealing glazing and panels, which are the subject of ISO 3934.[1)]

2 References

ISO 37, *Rubber, vulcanized — Determination of tensile stress-strain properties.*

ISO 48, *Vulcanized rubbers — Determination of hardness (Hardness between* 30 *and* 85 IRHD*).*

ISO 188, *Rubber, vulcanized — Accelerated ageing or heat-resistance tests.*

ISO/R 812, *Method of test for temperature limit of brittleness for vulcanized rubbers.*

ISO 815, *Vulcanized rubbers — Determination of compression set under constant deflection at normal and high temperatures.*

ISO 1431/1, *Rubber, vulcanized — Resistance to ozone cracking — Part 1 : Static strain test.*

ISO 1653, *Vulcanized rubbers — Determination of compression set under constant deflection at low temperatures.*

ISO 3302, *Rubber — Dimensional tolerances of solid moulded and extruded products.*

ISO 3387, *Rubbers — Determination of crystallization effects by hardness measurements.*

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

3 Type of material

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

4 Material and workmanship

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

4.2 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.

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

5 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.

6 General requirements

6.1 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.

6.2 Hardness

When tested in accordance with the method specified in ISO 48, the hardness shall comply with the requirements of the table.

1) ISO 3934, *Rubber building gaskets — Materials in preformed solid vulcanizates used for sealing glazing and panels — Specification.*

6.3 Tensile strength and elongation at break

When tested in accordance with the method specified in ISO 37 using a dumb-bell test piece, the tensile strength and elongation at break shall comply with the requirements of the table.

6.4 Compression set

When tested in accordance with the method specified in ISO 815, the compression set shall comply with the requirements of the table after 22 h at 100 °C.

6.5 Ozone resistance

When tested in accordance with the method specified in ISO 1431/1, test pieces shall show no cracks after 100 h at 40 °C, under 20 % elongation, at an ozone concentration of 200 pphm.

NOTE — It is intended to add a test combining heat ageing, water immersion and ozone exposure.

6.6 Low-temperature hardness change (not applicable in tropical countries)

When tested in accordance with the method specified in ISO 3387, the increase in hardness after 7 days at − 10 °C above the initial hardness at − 10 °C shall comply with the requirements of the table.

6.7 Accelerated ageing

After test pieces have been aged for 14 days at 100 °C in accordance with the method specified in ISO 188, the change in hardness, tensile strength, and elongation at break shall comply with the requirements of the table.

6.8 Lip seal pressure

Lip seal pressure should be measured according to the method described in the annex. 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.

7 Special requirements

These requirements are optional. Requirements and corresponding test methods shall be the subject of agreement between the interested parties.

7.1 Contact and migration staining

A suitable test method is described in ISO 3865.

7.2 Flammability

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

7.3 Low-temperature brittleness

A suitable test method is described in ISO/R 812.

It is suggested that brittleness temperature should be below − 25 °C for temperate climates and − 40 °C for arctic climates.

7.4 Low-temperature compression set

A suitable test method is described in ISO 1653.

It is suggested that when tested by this method, the compression set after 22 h at − 25 °C should be not more than 80 % for type E and not more than 90 % for type F.

Table — Property requirements

Property	Unit	Limits		Document specifying test method
		Type E	Type F	
Hardness	IRHD	75 ± 5	85 ± 5	ISO 48
Tensile strength, min.	MPa	12	12	ISO 37
Elongation at break, min.	%	175	125	ISO 37
Compression set after 22 h at 100 °C, max.	%	35	35	ISO 815
Ozone resistance 200 pphm; elongation 20 %; duration 100 h at 40 °C	—	No cracking	No cracking	ISO 1431/1 and sub-clause 6.5
Hardness increase after 7 days at − 10 °C, max.	IRHD	10	10	ISO 3387
Maximum change from unaged values after ageing for 14 days at 100 °C				
hardness	IRHD	+ 10 − 0	+ 10 − 0	ISO 188 + ISO 48
tensile strength	%	− 15	− 15	ISO 188 + ISO 37
elongation at break	%	− 40	− 40	ISO 188 + ISO 37

Annex

Lip seal pressure measurement

(This annex does not form part of the standard.)

A.1 Principle

This test method determines the pressure exerted by the gasket on adjacent material positioned within the gasket channel or channels. It simulates actual use conditions and provides a measurement of the force required to open the lips of the gasket channel to that distance representing the thickness of material for which the gasket is designed. In the case of double-channel gaskets, this measurement is made with a solid material of the intended thickness in position in the channel opposite to that being tested. Thus these measurements reflect the forces to be encountered during application.

A.2 Apparatus

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

A.2.2 The grips to be used with the testing machine described in A.2.1 shall be of a type similar to those shown in figure 1. They shall exert a uniform pressure across the surface of the grips. The pressure shall increase as the tension increases, so as to prevent uneven slipping.

A.2.3 The lip dividers used to separate the lips of the test piece shall be made of stainless steel, as shown in figure 2. Their length shall be at least equal to that of the test piece.

A.2.4 The dividers used to separate the lips of the moulded corner test piece shall be made of stainless steel, as shown in figure 2.

A.2.5 The metal spacers to be used when testing double-channel gaskets as shown in figure 1 shall be of the same width as the test piece, the same thickness as the material which the gasket is designed to hold, and at least 13 mm wider than the depth of the channel.

A.3 Test piece

A.3.1 The extruded test piece shall be a piece of the actual gasket at least 20 mm but not greater than 305 mm in length. A minimum of four test pieces from each lot shall be tested.

A.3.2 The corner test piece shall have two legs 25 mm long measured from the inside of the corner. A minimum of four test pieces from each lot shall be tested.

A.4 Procedure

A.4.1 Place the test piece in the testing machine as shown in figure 1, ensuring that the locking strip is in place and that, if it is a double-channel type gasket, the specified spacer is properly positioned in the channel opposite to that being tested. Provide means of supporting the test assembly so that when tension is applied to the channel lips the assembly will remain in a horizontal position (see note). It is important to ensure that the lip dividers have a secure hold on the gasket lips and that they are also securely held by the grips of the machine. The test shall be conducted at a standard laboratory temperature.

NOTE — When testing single-channel gaskets, the spacers obviously cannot be used. However, some means must be provided to hold the test piece in a horizontal position during the test.

A.4.2 Separate the lips of the gasket channel at a uniform speed of 5,0 ± 0,1 mm/min until the distance between the lips is equal to the minimum thickness of the material they are designed to hold.

A.4.3 When the lips have been separated the specified distance, stop the testing machine and record the force required to produce this opening.

A.4.4 Repeat the operations in A.4.1 to A.4.3 until all the extruded or moulded corner channels of a minimum of four test pieces of each type have been tested.

A.4.5 The lip seal pressure, p_{LS}, of each channel tested is given, in newtons per metre, by the formula

$$p_{LS} = \frac{F}{L}$$

where

F is the force, in newtons, required to open the lips of the test piece to the specified distance;

L is the length, in metres, of the test piece measured to the nearest 0,002 m (see note).

NOTE — For a moulded corner specimen, L is measured from the outside of the corner.

Dimensions in millimetres

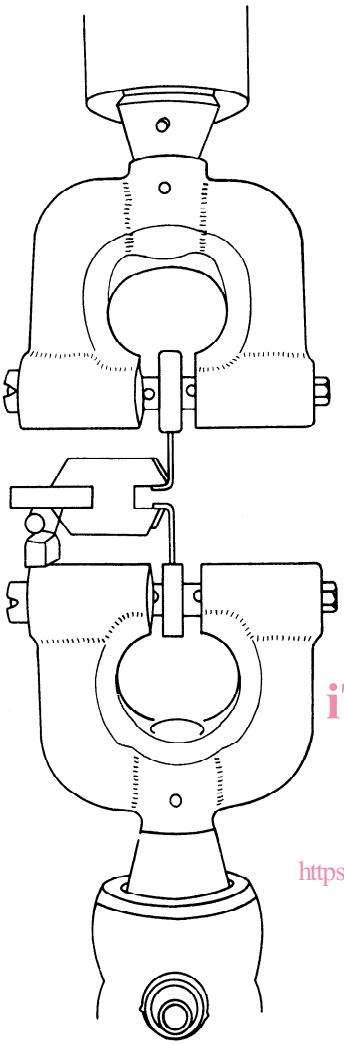
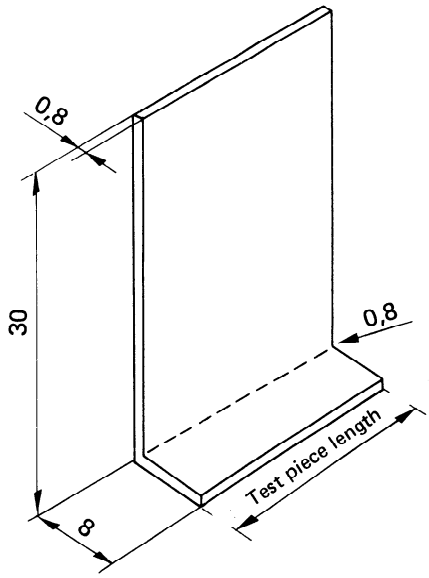
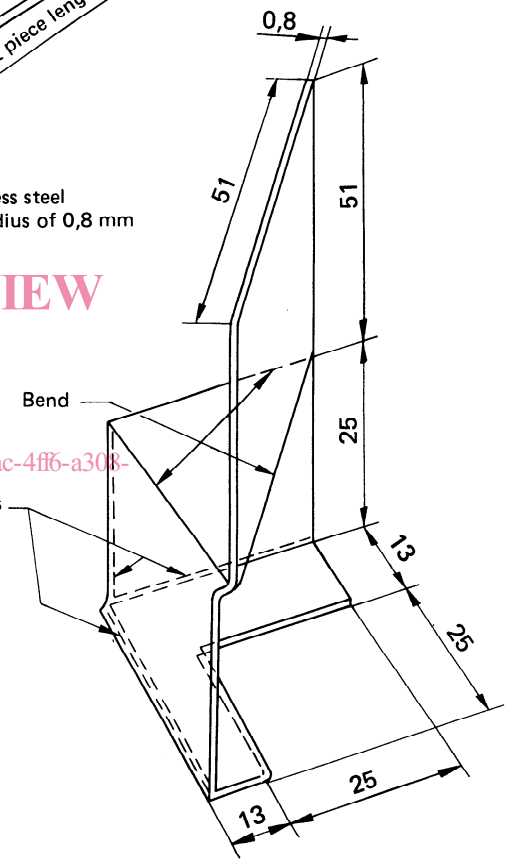


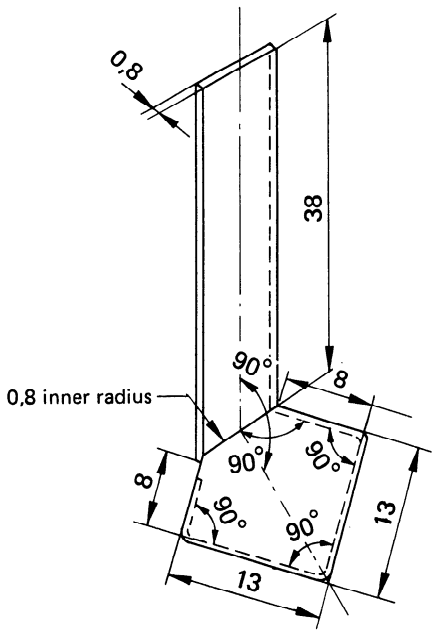
Figure 1 — Tension tester for lip seal pressure



a) **Extruded section**
Jig made from 0,8 mm stainless steel
All bends to have an inner radius of 0,8 mm



b) **Moulded corner (outside)**



c) **Moulded corner (inside)**

Figure 2 — Lip dividers

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