
**Gumeni materiali za tesnila in membrane v plinskih aparatih in plinskih napravah -
Dopolnilo A1**

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

Elastomer-Werkstoffe für Dichtungen und Membranen in Gasgeräten und Gasanlagen

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

Ta slovenski standard je istoveten z: EN 549:2019/prA1

ICS:

83.140.50	Tesnila	Seals
91.140.40	Sistemi za oskrbo s plinom	Gas supply systems

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ICS 23.040.80; 83.140.50

English Version

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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 draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 208.

This draft amendment A1, if approved, will modify the European Standard EN 549:2019. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment was established by CEN 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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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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COMITÉ EUROPÉEN DE NORMALISATION
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European foreword

This document (EN 549:2019/prA1:2022) 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 document is currently submitted to the CEN Enquiry.

This amendment adds voluntary tests for sealing materials regarding resistance to gas - change of volume, resistance to condensate/liquid phase of combustible gases – change of volume and stress relaxation in compression.

This document has been prepared under a Standardization Request given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s) / Regulation(s).

For relationship with EU Directive(s) / Regulation(s), see informative Annex ZA, which is an integral part of EN 549:2019.

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EN 549:2019/prA1:2022 (E)

1 Modification to the whole text

In the entire document, for all instances found:

Replace “EN 549:2019” with “EN 549:2019+prA1:2022”.

2 Modification to 6.2 “Requirements for rubber material used to manufacture seals”

Delete the existing Table 3 and replace with the following:

Table 3 — Requirements for rubber material used to manufacture seals

Property	Unit	Hardness class		
		H1	H2	H3
<i>Hardness</i>				
Tolerance on stated nominal hardness	IRHD-M	±5	±5	±5
<i>Tensile strength</i>	MPa	≥ 5	≥ 7	≥ 7
<i>Elongation at break</i>	%	≥ 125	≥ 125	≥ 125
<i>Compression set</i>				
— at high temperature ^a	%	≤ 40	≤ 40	≤ 40
— at low temperature 0 °C	%	≤ 40	≤ 40	≤ 40
— at low temperature –20 °C	%	≤ 50	≤ 50	≤ 50
— at low temperature –30 °C	%	≤ 70	≤ 70	≤ 70
— at low temperature –40 °C	%	≤ 75	≤ 75	≤ 75
<i>Resistance to ageing</i>				
— change in hardness, max.	IRHD-M	±10	±10	±10
— change in tensile strength, max.	%	– 40	– 40	– 40
— change in elongation at break, max.	%	– 40	– 40	– 40
<i>Resistance to gas</i> ^b				
— change in mass after immersion, max.	%	+10 –5	+10 –5	+10 –5
— change in mass after drying, max.	%	+5 –8	+5 –8	+5 –8
<i>Resistance to condensate/liquid phase of combustible gases</i> ^c				
— change in mass after immersion, max.	%	+ 20	+ 20	+ 20
— change in mass after drying, max.	%	– 15	– 12	– 10

Property	Unit	Hardness class		
		H1	H2	H3
<i>Resistance to lubricant</i> ^d — change in hardness, max. — change in mass, max.	IRHD-M %	±10 +15 -10	±10 +15 -10	±10 +15 -10
<i>Resistance to ozone</i> ^e		no cracks		
<i>Resistance to gas — Change in volume</i> ^{f, g} — change in volume after immersion, max. — change in volume after drying, max.	% %	for reference for reference	for reference for reference	for reference for reference
<i>Resistance to condensate/liquid phase of combustible gases — Change in volume</i> ^{h, i} — change in volume after immersion, max. — change in volume after drying, max.	% %	for reference for reference	for reference for reference	for reference for reference
<i>Stress relaxation in compression</i> ^j 90 d at 23 °C	%	21	18	21
<p>a The test piece shall not be damaged by adhering to the surface of the test apparatus.</p> <p>b For silicone material there is no requirement for change in mass after immersion as swelling by some such materials may be substantial, the requirement for change in mass after drying, is ± 5 %.</p> <p>c This requirement is only applicable if the material has been declared as resistant to condensate/liquid phase of combustible gases</p> <p>d For silicone material the requirement for change in hardness and mass are ± 15 IRHD and ± 10 % respectively.</p> <p>e This requirement is only applicable if the material has been declared to be ozone resistant.</p> <p>f This requirement is applicable for an additional voluntary test only.</p> <p>g For silicone material there is no exception defined.</p> <p>h This requirement is applicable for an additional voluntary test only.</p> <p>i For silicone material there is no exception defined.</p> <p>j This requirement is applicable for an additional voluntary test only.</p>				

3 Modification to Clause 7 “Test methods”

Add the following subclauses:

7.10 Stress relaxation in compression

The stress relaxation shall be determined by Method A of ISO 3384:1999, using a test piece in accordance with 5.1, after applying mechanical and thermal conditioning. Measurements shall be taken after 3 h, 1 day, 3 days, 7 days, 30 days and 90 days. The best fit straight line shall be determined by regression analysis using a logarithmic time scale. The 90 days requirement in Table 3 is those derived from these straight line.

The stress relaxation in compression shall conform to the requirement given in Table 3.

For continuous measurements using an apparatus described in the first paragraph of 5.2 of ISO 3384:1999, the requirements in Table 3 are those derived from the measurement at 90 days.

The test temperature shall be maintained within the specified tolerance during the whole period of the test and verified by suitable recording equipment on a continuous basis.

If the test piece is taken from a seal, then the measurement shall be carried out as far as possible in the direction of compression of the seal in service.

[SOURCE: EN 682:2002+A1:2005, 4.2.7, modified – all references to the 7 days test have been removed]

7.11 Resistance to gas — Change of volume

Following the procedure according to 7.6 “Resistance to gas”. Determine the change of volume instead of mass.

7.12 Resistance to condensate/liquid phase of combustible gases — Change of volume

Following the procedure according to 7.7 “Resistance to condensate/liquid phase of combustible gases”. Determine the change of volume instead of mass.

4 Modification to Annex A “Requirements and test of components”

Delete the existing Table A.1 and replace with the following:

Table A.1 — Requirements for component seals

Property	Unit	Components of 2 mm thickness	Components of < 2 mm thickness
Hardness^a Tolerance on stated nominal hardness	IRHD	±5	±5
Resistance to ageing Change in hardness, max.	IRHD	±10	±10
Resistance to gas^b Change in mass after immersion, max.	%	+10 -5	+10 -9
Change in mass after drying, max.	%	+5 -8	+5 -12
Resistance to condensate/liquid phase of combustible gas^c Change in mass after immersion, max.	%	+ 25	+ 25
Change in mass after drying, max.	%	- 15	- 15
Resistance to lubricant^d Change in hardness, max.	IRHD	±10	±10
Change in mass, max.	%	+15 -10	+15 -10
Resistance to ozone^e		no crack	no cracks
Resistance to gas — Change in volume^{f, g} Change in volume after immersion, max.	%	for reference	for reference
Change in volume after drying, max.	%	for reference	for reference
Resistance to condensate/liquid phase of combustible gases — Change in volume^{h, i} Change in volume after immersion, max.	%	for reference	for reference
Change in volume after drying, max.	%	for reference	for reference

^a For components of less than 3 mm cross-section (for O-Ring cross section diameter) the requirement for hardness tolerance is $\begin{matrix} +5 \\ -7 \end{matrix}$ IRHD.

^b For silicone seals there is no requirement for change in mass after immersion as swelling by some such materials may be substantial and the requirement for change in mass after drying is ± 5 %.

^c This requirement is only applicable if the material has been declared as resistant to condensate/liquid phase of combustible gases

^d For silicone seals the requirement for change in hardness and mass are ± 15 IRHD and $\begin{matrix} +10 \\ -1 \end{matrix}$ % respectively.

^e This requirement is only applicable if the seal has been declared to be ozone resistant.

^f This requirement is applicable for an additional voluntary test only.

^g For silicone material there is no exception defined.

^h This requirement is applicable for an additional voluntary test only.

ⁱ For silicone material there is no exception defined.

EN 549:2019/prA1:2022 (E)

5 Modification to the Bibliography

Add the following to the Bibliography:

“EN 682:2002+A1:2005, Elastomeric seals — Material requirements for seals used in pipes and fittings carrying gas and hydrocarbon fluids”

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