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|  | Certification programme ZP 5100 for conformity assessment of rubber materials for seals and diaphragms in gas appliances and systems according to DIN EN 549:2019+A1:2023+A2:2024 | 55100-00-N-EN | |
| | | Doc. type | ZP |
| | | Author | DVGW CERT GmbH |
| | | Stand | 12.09.2024 |

Certification programme ZP 5100
of DVGW CERT GmbH, Bonn


for conformity assessment

of rubber materials for seals and diaphragms
in gas appliances and systems

according to
DIN EN 549:2019+A1:2023+A2:2024

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0 Preliminary remark

This certification programme specifies the requirements for the conformity assessment of rubber materials for seals and diaphragms in gas appliances and gas systems.

Certification, recertification and surveillance of a rubber material in accordance with DIN EN 549 by DVGW CERT GmbH is only carried out if the tests described in this document have been performed and the corresponding requirements of the standard are fulfilled.

The surveillance scopes specified in this document are based on the resolutions of DVGW G-TK-2.4 "Components and auxiliary materials - gas" of 14 December 2005.

This document is only applicable in conjunction with DIN EN 549:2019+A1:2023+A2:2024 and, if applicable, with DVGW CERT ZP 5101, provided that the type examination certificate has been extended to include the optional hydrogen tests.

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1 Certification procedure

Products Gas national

2 Accreditations

An accreditation No. D-ZE-16028-01 exists for the procedure at German accreditation body (die Deutsche Akkreditierungsstelle GmbH) (DAkkS), Berlin.

3 Certification mark

DVGW resp. DIN-DVGW certification mark Products



Registration number scheme:

DG-5101DP0001 resp. NG-5101DP0001


DG = DVGW certification mark for gas,

NG = DIN-DVGW certification mark for gas,

5101 = product code, DP = 2024, 0001 = serial no.

4 Type of certificate and test procedure

Type examination certificate (5-year term)


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5 Scope

| Product group | Product code | Product type |
|--|--------------|---|
| Elastomer materials for seals and diaphragms | 5101 | Elastomer material for seals in gas appliances and equipment with life assessment |
| | 5102 | Elastomer material for diaphragm and seals in gas appliances and equipment with life assessment |
| | 5104 | Elastomer material for seals in gas supply mains and pipelines with life assessment |
| | 5105 | Materials for diaphragm in gas appliances and equipment, not reinforced, with life assessment |
| | 5112 | Elastomer material for seals in gas appliances |
| | 5131 | Materials for membranes for gas appliances and equipment, not reinforced |
| | 5132 | Materials for membranes for gas appliances and equipment, reinforced |
| | 5133 | Materials for membranes for gas equipment |
| | 5139 | Elastomer material for diaphragm and seals for gas appliances and equipment |

6 Testing laboratories

Testing laboratories accredited in accordance with EN ISO/IEC 17025 for the relevant test bases and contractually bound to DVGW CERT GmbH.

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7 Requirements

7.1 General information

7.1.1 Functional requirements

The functional requirements apply in accordance with DIN EN 549, whereby a distinction must be made between basic and optional requirements.

The basic requirements differ according to the application of the material, for

- Seal
- Membrane (unreinforced)
- Reinforced membrane
- Seal and diaphragm

7.1.2 Hygienic requirements

For gas products, the hygiene requirements for materials in contact with drinking water do not apply.

7.2 Type examination (type testing)


7.2.1 Test contents

In accordance with DIN EN 549+A1:2023+A2:2024
and, if applicable, in accordance with DVGW CERT ZP 5101:2024-09.

7.2.2 Test sample

For type testing (type examination), at least two test samples measuring (200 x 200 x 2 ± 0.2) mm and one test sample measuring (200 x 200 x 6.3 ± 0.3) mm must be submitted to the testing laboratory by the client. The slab size may vary by agreement, the thickness must be adhered to. Samples should not be taken from moulded parts.

In the case of reinforced membranes, additional moulded parts for testing delamination in accordance with A.3.4 - A.3.6 must also be considered.

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7.2.3 Examinations


| <i>Feature</i> | <i>Seal</i> | <i>Membrane</i> | <i>Reinforced membrane</i> | <i>Seal and diaphragm</i> |
|--|-------------|-----------------|----------------------------|---------------------------|
| 7.2 Hardness | X | X | X | X |
| 7.3 Tensile strength and elongation at break | X | X | X | X |
| 7.4 Compression set | | | | |
| - at high test temperature | X | X | X | X |
| - at low temperature 0 °C or -20 °C | X | X | X | X |
| - at low temperature -30 °C or -40 °C | optional | optional | optional | optional |
| 7.5 Resistance to ageing | X | X | X | X |
| 7.6 Resistance to gas | X | X | X | X |
| 7.7 Resistance to condensate/liquid phase of combustible gases | optional | optional | optional | optional |
| 7.8 Resistance to lubricants | X | X | X | X |
| 7.9 Resistance to ozone | optional | X | X | X |
| 7.10 Stress relaxation in compression | optional | -- | -- | optional |
| 7.11 Resistance to gas - Change of volume | optional | optional | optional | optional |
| 7.12 Resistance to condensate/liquid phase of combustible gases - Change of volume | optional | optional | optional | optional |
| 8. Evaluation of life-time for material used to manufacture seals | optional | -- | -- | optional |
| 9 Infrared spectra of the material | X | X | X | X |
| A.3.4 Resistance to gas | -- | -- | X | -- |
| A.3.5 Resistance to condensate/liquid phase of combustible gases | -- | -- | only if 7.7 | -- |
| A.3.6 Resistance to lubricants | -- | -- | X | -- |

Remark: --

Legend:

"X": Basic requirement

"optional": Optional requirement that can also be considered and evaluated

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7.2.4 Product documentation

For testing and certification, the manufacturer must submit complete product documentation containing at least the following information:

- Unique designation of the rubber material;
- Application (seal, diaphragm...);
- the nominal hardness;
- maximum operating temperature;
- minimum operating temperature;
- Information on the ozone resistance of the material (optional for seals, essential for diaphragms);
- optional requirements as far as chosen.

For reinforced materials, the specification of the reinforcement, which must be included as a minimum:

- Polymer type (for example polyester, nylon, cotton or silk);
- Basis weight (g/m²);
- Yarn type;
- Textile construction;
- Thread count in warp and weft;
- Yarn twist.

7.3 Surveillance

The specifications described in the "Surveillance procedure" section of the rules of procedure apply. This certification programme describes the "Control test" procedure.


7.3.1 Production control by the manufacturer (self-surveillance)

Not applicable

7.3.2 surveillance test (external surveillance)

Specific material samples (slabs) are required for testing. External monitoring is carried out annually in the testing laboratories. At least two test samples measuring (200 x 200 x 2 ± 0.2) mm and one test sample measuring (200 x 200 x 6.3 ± 0.3) mm must be submitted to the test centre by the client for the control test. The slab size may vary by agreement, the thickness must be adhered to. A distinction is made between rubbers without ozone resistance and ozone-resistant rubbers.

For the renewal of an expiring certificate, a supplementary scope of testing is defined; slabs and/or moulded parts can be used for testing the infrared spectra.

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7.3.3 Examinations

Rubbers without ozone resistance

| <i>Feature</i> | <i>Seal</i> | <i>Membrane</i> | <i>Reinforced membrane</i> | <i>Seal and diaphragm</i> |
|--|-------------|-----------------|----------------------------|---------------------------|
| 7.2 Hardness | X | -- | -- | -- |
| 7.3 Tensile strength and elongation at break | X | -- | -- | -- |
| 7.4 Compression set | | | | |
| - at high test temperature | X | -- | -- | -- |
| - at low temperature 0 °C or -20 °C | X | -- | -- | -- |
| 7.9 Resistance to ozone | -- | -- | -- | -- |


Ozone-resistant rubbers

| <i>Feature</i> | <i>Seal</i> | <i>Membrane</i> | <i>Reinforced membrane</i> | <i>Seal and diaphragm</i> |
|--|-------------|-----------------|----------------------------|---------------------------|
| 7.2 Hardness | X | X | X | X |
| 7.3 Tensile strength and elongation at break | X | X | X | X |
| 7.4 Compression set | | | | |
| - at high test temperature | -- | -- | -- | -- |
| - at low temperature 0 °C or -20 °C | X | X | X | X |
| 7.9 Resistance to ozone | X | X | X | X |

Additional scope of testing for certificate renewal

| <i>Feature</i> | <i>Seal</i> | <i>Membrane</i> | <i>Reinforced membrane</i> | <i>Seal and diaphragm</i> |
|---|-------------|-----------------|----------------------------|---------------------------|
| 9 Infrared spectra of the material (Annex D, 2.3) | X | X | X | X |
| <i>Optional examinations if selected:</i> | | | | |
| 7.4 Compression set - at low temperature -30 °C or -40 °C | X | X | X | X |
| 7.7 Resistance to condensate/liquid phase of combustible gases | X | X | X | X |
| DVGW CERT ZP 5101 7.3 Determination of gas permeability ¹ | X | X | X | X |

¹ If the supplementary test report in accordance with DVGW CERT ZP 5101 is less than two years old at the time of renewal, it will be recognised in accordance with the DVGW CERT GmbH rules of procedure for the certification of products in the non-harmonised area.

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8 Marking

In accordance with the specifications of the applicable product standards in the "Marking" chapter, as well as supplementary requirements from the DVGW CERT GmbH rules of procedure in accordance with the "Marking" chapter.

9 Applicable documents

In the case of undated references, the current edition of the following documents applies.

- DVGW CERT GmbH <40014> Geschäftsordnung der DVGW CERT GmbH zur Zertifizierung von Produkten im nicht harmonisierten Bereich
- DVGW CERT GmbH <55101> Zertifizierungsprogramm ZP 5101
Verträglichkeit und Permeationseigenschaften von Elastomerwerkstoffen für Dichtungen u. Membranen in Gasgeräten u. -anlagen gegen-über Wasserstoff für einen Gehalt von bis zu 100 Vol. % H₂
- DIN EN 549:2024-07
Elastomer-Werkstoffe für Dichtungen und Membranen in Gasgeräten und Gasanlagen; Deutsche Fassung EN 549:2019+A1:2023+A2:2024
- EN ISO/IEC 17025
Allgemeine Anforderungen an die Kompetenz von Prüf- und Kalibrierlaboratorien

The current issue status applies.

10 Period of validity

This certification programme is valid from 12.09.2024.