

EHITUSKLAAS. KLAASPAKETID. OSA 4: SERVATIHENDI
KOMPONENTIDE JA SISETÜKKIDE FÜÜSIKALISTE
OMADUSTE KATSEMEETODID

Glass in Building - Insulating Glass Units - Part 4:
Methods of test for the physical attributes of edge seal
components and inserts

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 1279-4:2018 sisaldab Euroopa standardi EN 1279-4:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 1279-4:2018 consists of the English text of the European standard EN 1279-4:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 25.07.2018.	Date of Availability of the European standard is 25.07.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 81.040.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

**Glass in Building - Insulating Glass Units - Part 4: Methods
of test for the physical attributes of edge seal components
and inserts**

Verre dans la construction - Vitrage isolant préfabriqué
scellé - Partie 4 : Méthodes d'essai des propriétés
physiques des composants et inserts

Glas im Bauwesen - Mehrscheiben-Isolierglas - Teil 4:
Verfahren zur Prüfung der physikalischen
Eigenschaften der Komponenten des Randverbundes
und der Einbauten

This European Standard was approved by CEN on 9 March 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists 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.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	5
1 Scope.....	7
2 Normative references.....	7
3 Terms and definitions	7
4 Symbols and abbreviations	8
4.1 Symbols and units.....	8
4.2 Abbreviated terms.....	9
4.3 Indexes.....	9
5 Requirements for sealants.....	9
5.1 General.....	9
5.2 Physicochemical characterization	10
5.3 Outer sealant strength.....	11
5.4 Additional requirements.....	12
5.5 Characteristics for the substitution of sealants	12
5.5.1 Crossover stress (σ_C).....	12
5.5.2 Water vapour transmission rate (WVTR)	12
5.5.3 Gas permeation rate (GPR).....	12
5.6 Test report for sealant.....	12
6 Requirements for desiccants in bulk	15
6.1 General.....	15
6.2 Physicochemical characterization of desiccants in bulk	15
6.2.1 X-ray Fluorescence Spectroscopy (XRF).....	15
6.2.2 X-ray Diffraction (XRD).....	15
6.2.3 Bulk density	15
6.2.4 Available Water Adsorption Capacity (AWAC).....	15
6.2.5 Correlation between ΔT , available water adsorption capacity (AWAC) and loss on ignition (LOI)	15
6.3 Performance requirements.....	17
6.3.1 Loss on Ignition (LOI at 540 °C).....	17
6.3.2 Standard moisture adsorption capacity (T_C)	17
6.3.3 Gas desorption	17
6.4 Additional requirements.....	17
6.5 Report for desiccants in bulk.....	17
7 Requirements for preformed flexible spacer incorporating desiccant.....	19
7.1 General.....	19
7.2 Physicochemical characterization	19
7.2.1 Identification	19
7.2.2 T_C and T_O values.....	19
7.3 Additional requirements.....	20
7.4 Report.....	20
8 Requirements for inserts containing polymer materials.....	20
8.1 General.....	20
8.2 Water content.....	20

8.3	Volatile content.....	20
8.4	Fogging.....	20
8.5	Report	20
Annex A (normative) Adhesion test for outer sealants and metal edge seals.....		21
A.1	Outer sealants	21
A.2	Metallic edge seals.....	25
Annex B (normative) Adhesion on coatings and interlayer adhesion of coatings		27
B.1	General.....	27
B.2	Composition of coatings	27
B.3	Evaluation.....	27
B.4	Test report.....	29
Annex C (normative) Fogging test.....		32
C.1	General.....	32
C.2	Principle of the test	32
C.3	Test conditions	32
C.4	Visual inspection and requirements.....	32
C.5	Exposure equipment.....	33
C.6	Test report.....	33
Annex D (normative) Methods of water vapour transmission rate and gas permeation rate determination		37
D.1	Method for determination of water vapour transmission rate (WVTR)	37
D.2	Method for determination of gas permeation rate (GPR)	40
Annex E (normative) Test methods for desiccants in bulk		43
E.1	Determination of loss on ignition LOI, T_i and T_f (at 540 °C)	43
E.2	Determination of available water adsorption capacity (AWAC)	44
E.3	Calculation of the standard moisture adsorption capacity (T_c)	46
E.4	Determination of gas desorption	46
E.5	Bulk density	48
Annex F (normative) Karl Fischer method for determination of moisture content of polymeric matrices incorporating desiccant.....		51
F.1	General.....	51
F.2	Materials and apparatus	51
F.3	Preparatory work	51
F.4	Determination of moisture content T_o , T_i and T_f	52
F.5	Determination of standard moisture adsorption capacity T_c	53
F.6	Accuracy of the method	53

Annex G (normative) Gravimetric method for determination of moisture content of polymeric matrices incorporating desiccant.....	54
G.1 General.....	54
G.2 Materials and apparatus.....	54
G.3 Determination of T_o, T_i, T_f and T_c.....	54
Annex H (normative) Volatile content test	56
H.1 General.....	56
H.2 Principle of the test	56
H.3 Apparatus.....	56
H.4 Test samples	56
H.5 Test procedure.....	56
H.6 Test report.....	57
Annex I (informative) Example of a sun simulating radiation source	58
Annex J (informative) Sealant sheet preparation for WVTR and GPR measurements	59
J.1 Preparation of sheets.....	59
J.2 Method 1.....	59
J.3 Method 2.....	59
J.4 Evaluation of sheet	60
Bibliography.....	61

European foreword

This document (EN 1279-4:2018) has been prepared by Technical Committee CEN/TC 129 “Glass in building”, the secretariat of which is held by NBN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2019 and conflicting national standards shall be withdrawn at the latest by January 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 1279 4:2002.

The main changes compared to the previous edition are:

- a) The standard has been fully technically and editorially revised;
- b) The scope has been changed;
- c) Terms and definitions have been transferred to EN 1279-1:2018;
- d) For sealants physicochemical characterization have been added and requirements were changed;
- e) For desiccants in bulk physicochemical characterization, test methods and requirements have been added;
- f) For polymeric matrices incorporating desiccant and inserts requirements have been added;
- g) Annexes have been renumbered;
- h) Annex A has been technically revised
- i) Annex C: Fogging test was transferred from EN 1279-6, Annex C and test temperature was modified;
- j) Annex D: description of the method to determine GPR has been revised;
- k) Annexes E, G, J are new;
- l) Annex F: Karl-Fischer-Determination was transferred from EN 1279-2, Annex C;
- m) Annex H: Volatile test was transferred from EN 1279-6, Annex G;
- n) Former Annex B: Edge seal strength comparison was transferred to EN 1279-1:2018, Annex E;
- o) Former Annex E: Informative tests were deleted.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

EN 1279, *Glass in Building - Insulating glass units* consists of the following parts:

- *Part 1: Generalities, system description, rules for substitution, tolerances and visual quality;*
- *Part 2: Long term test method and requirements for moisture penetration;*
- *Part 3: Long term test method and requirements for gas leakage rate and for gas concentration tolerances;*
- *Part 4: Methods of test for the physical attributes of edge seal components and inserts;*
- *Part 5: Product standard;*
- *Part 6: Factory production control and periodic tests.*

These parts are inextricably bound up with each other.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This document specifies the requirements and describes the test methods for edge seal components and inserts. This includes the identification, the determination of physical attributes and the evaluation of characteristics for use in substitution rules in accordance with EN 1279-1:2018.

For the purpose to demonstrate that edge seal components will allow the insulating glass unit to conform to the requirements given in EN 1279-1:2018, Clause 6, EN 1279-2:2018 and EN 1279-3:2018 also apply.

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.

EN 410, *Glass in building — Determination of luminous and solar characteristics of glazing*

EN 1279-1:2018, *Glass in building — Insulating glass units — Part 1: Generalities, system description, rules for substitution, tolerances and visual quality*

EN 1279-2:2018, *Glass in building — Insulating glass units — Part 2: Long term test method and requirements for moisture penetration*

EN 1279-3:2018, *Glass in building — Insulating glass units — Part 3: Long term test method and requirements for gas leakage rate and for gas concentration tolerances*

EN 1279-6:2018, *Glass in building — Insulating glass units — Part 6: Factory production control and periodic tests*

EN 13022-1, *Glass in building - Structural sealant glazing - Part 1: Glass products for structural sealant glazing systems for supported and unsupported monolithic and multiple glazing*

EN ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method (ISO 1183-1)*

EN ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines - Calibration and verification of the force-measuring system (ISO 7500-1)*

EN ISO 10563, *Buildings and civil engineering works — Sealants — Determination of change in mass and volume (ISO 10563)*

EN ISO 11358-1:2014, *Plastics — Thermogravimetry (TG) of polymers — Part 1: General principles (ISO 11358-1:2014)*

ISO 5893, *Rubber and plastics test equipment — Tensile, flexural and compression types (constant rate of traverse) — Specification*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 1279-1:2018 apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>