



SLOVENSKI STANDARD

SIST EN 1279-6:2018

01-oktober-2018

Nadomešča:
SIST EN 1279-6:2004

Steklo v gradbeništvu - Izolacijsko steklo - 6. del: Notranja kontrola proizvodnje in periodični preskusi

Glass in building - Insulating glass units - Part 6: Factory production control and periodic tests

Glas im Bauwesen - Mehrscheiben-Isolierglas - Teil 6: Werkseigene Produktionskontrolle und wiederkehrende Prüfungen

Verre dans la construction - Vitrage isolant - Partie 6: Contrôle de production en usine et essais périodiques <https://standards.iteh.ai/catalog/standards/sist/691cc85c-876b-4ec5-a3a1-27630cdd9be0/sist-en-1279-6-2018>

Ta slovenski standard je istoveten z: EN 1279-6:2018

ICS:

81.040.20 Steklo v gradbeništvu Glass in building

SIST EN 1279-6:2018 **en,fr,de**

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EUROPEAN STANDARD

EN 1279-6

NORME EUROPÉENNE

EUROPÄISCHE NORM

July 2018

ICS 81.040.20

Supersedes EN 1279-6:2002

English Version

Glass in building - Insulating glass units - Part 6: Factory production control and periodic tests

Verre dans la construction - Vitrage isolant - Partie 6:
Contrôle de production en usine et essais périodiques

Glas im Bauwesen - Mehrscheiben-Isolierglas - Teil 6:
Werkseigene Produktionskontrolle und
wiederkehrende Prüfungen

This European Standard was approved by CEN on 8 March 2018.

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

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Contents

	Page
European foreword.....	5
1 Scope	7
2 Normative references	7
3 Terms and definitions and symbols	7
3.1 Terms and definitions	7
3.2 Symbols.....	8
4 Factory production control requirements	8
4.1 General.....	8
4.2 Organization	8
4.2.1 Responsibility and authority	8
4.2.2 Management representative for factory production control.....	8
4.2.3 Management review.....	8
4.3 Factory production control system	8
4.3.1 General.....	8
4.3.2 Personnel	9
4.3.3 Documentation.....	9
4.4 Equipment	9
4.4.1 Testing.....	9
4.4.2 Manufacturing.....	9
4.4.3 Inspection and testing.....	9
4.4.4 Non-complying materials / products.....	9
Annex A (normative) Inspection and testing tables of insulating glass units	10
A.1 General.....	10
A.2 Specific requirements.....	11
A.3 Use of proxy testing.....	11
Annex B (normative) Periodic testing and inspection	33
B.1 General.....	33
B.2 Frequency and sampling	33
B.2.1 Frequency	33
B.2.2 Sampling.....	33
B.3 Conformity to the system description	33
B.3.1 Inspection	33
B.3.2 Requirements	33
B.3.3 Corrective actions	34
B.4 Moisture penetration index and gas concentration	34
B.4.1 General.....	34
B.4.2 Procedure.....	34
B.4.3 Test procedure.....	34

B.4.4	Requirement.....	35
B.4.4.1	Requirement on T_i and moisture penetration index	35
B.4.4.2	Requirements on gas concentration.....	35
B.5	Corrective Actions in case of non-conformity	35
B.6	Report	35
Annex C (informative) Adhesion test for leaded light strip.....		36
C.1	Purpose	36
C.2	Equipment.....	36
C.3	Test specimen	36
C.4	Procedure	36
C.5	Test report	37
Annex D (informative) Sealant, adhesion measurements		38
D.1	General	38
D.2	Standard method	38
D.2.1	Instruments	38
D.2.2	Test specimens	38
D.2.2.1	Glass-glass specimen	38
D.2.2.2	Spacer-spacer specimen.....	39
D.2.3	Test procedure	39
D.2.4	Test report	39
D.3	Other methods	39
D.3.1	Tensile test.....	39
D.3.2	Butterfly test.....	40
Annex E (informative) Sealants, hardness measurements.....		41
E.1	General	41
E.2	Instruments	41
E.3	Test specimen	41
E.4	Measurement	42
E.5	Report	42
Annex F (informative) Two component sealants: check on the thoroughness of mixing.....		43
F.1	Purpose	43
F.2	Test specimen	43
F.3	Test procedure	43
F.4	Report	43
Annex G (informative) Tightness check of hollow spacer closed by welding on the back.....		44
G.1	Purpose	44

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SIST-EN-1279-6:2018

<https://standards.iteh.ai/catalog/standards/sist/691cc85c-876b-4ec5-a3a1-27630cdd9be0/sist-en-1279-6-2018>

EN 1279-6:2018 (E)

G.2	Equipment	44
G.3	Test specimen.....	44
G.4	Procedure.....	44
G.5	Test report.....	44
Annex H (informative) Desiccant, water adsorption capacity check		45
H.1	General.....	45
H.2	Determination of the water adsorption capacity of desiccant in bulk	45
H.2.1	Principle	45
H.2.2	Equipment	45
H.2.3	Method	45
H.3	Determination of the water adsorption capacity of polymeric matrix incorporating desiccant.....	46
Annex I (informative) Desiccant Matrix Adhesion test in u-channels.....		47
I.1	General.....	47
I.2	Materials.....	47
I.3	Test procedure	47
I.4	Requirement.....	47
Annex J (informative) Adhesion tests for insulating glass units with prefabricated flexible spacer incorporating desiccant.....		48
J.1	Adhesion test of spacer to sealant.....	48
J.1.1	General.....	48
J.1.2	Materials.....	48
J.1.3	Test preparation and procedure	48
J.1.4	Requirements	48
J.2	Wet out strain and shear test.....	49
J.2.1	Materials.....	49
J.2.2	Test procedure	49
J.2.3	Requirements	53
Annex K (informative) Reference method for dew point temperature measurement.....		54
K.1	General.....	54
K.2	Apparatus and materials.....	54
K.3	Procedure.....	54
Bibliography.....		56

European foreword

This document (EN 1279-6:2018) 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 1279-6:2002.

The main changes compared to the previous edition EN 1279-6:2002 are:

- a) The standard has been fully technically and editorially revised;
- b) The scope has been changed;
- c) Terms and definitions and symbols have been moved to EN 1279-1:2018;
- d) The annexes have been renumbered;
- e) Annex A of former standard partly moved to EN 1279-1:2018;
- f) Annex B: tables were restructured and new systems added;
- g) Annexes I and J: added to describe tests for new systems;
- h) Annex K: dew point measurement added from EN 1279-2:2018;
- i) Annexes C and G of former standard moved to new EN 1279-4:2018, Annex J and I.

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

This European Standard “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 on water vapour 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 sealant components and inserts;*
- *Part 5: Product standard;*
- *Part 6: Factory production control and periodic tests.*

These parts are inextricably bound up with each other.

EN 1279-6:2018 (E)

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.

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1 Scope

This document describes the routine factory production control, the periodic testing and inspection and test methods to verify that an insulating glass unit (IGU) conforms to the system description.

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 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 1279-4:2018, *Glass in building — Insulating glass units — Part 4: Methods of test for the physical attributes of edge seal components and inserts*

EN 10204, *Metallic products — Types of inspection documents*

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 15434, *Glass in building — Product standard for structural and/or ultraviolet resistant sealant (for use with structural sealant glazing and/or insulating glass units with exposed seals)*

ISO/IEC 17050-1:2004, *Conformity assessment — Supplier's declaration of conformity — Part 1: General requirements*

ISO/IEC 17050-2:2004, *Conformity assessment — Supplier's declaration of conformity — Part 2: Supporting documentation*

3 Terms and definitions and symbols

3.1 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>

EN 1279-6:2018 (E)

3.2 Symbols

Symbol	Characteristic	Unit
c_i	concentration of gas i determined in accordance with EN 1279-3:2018, 6.34 determined before the audit test (see Annex B)	%
c_s	concentration of gas i determined in accordance with EN 1279-3:2018, 6.34 determined after the audit test (see Annex B)	%
I	moisture penetration index	
I_{req}	moisture penetration index requirement	
T_i	initial moisture content	
T_f	final moisture content	

4 Factory production control requirements

4.1 General

The factory production control system shall consist of procedures, regular inspections and tests and/or assessments and the use of the results to control incoming materials or components (raw and other), equipment, the production process and the product.

NOTE A factory production control system conforming to EN ISO 9001 [1] and made specific to the requirements of this annex is deemed to satisfy the requirements of this annex.

4.2 Organization

4.2.1 Responsibility and authority

The responsibility, authority and the interrelation of all personnel who manage, perform and verify work affecting quality shall be defined, particularly for personnel who need the organizational freedom and authority to:

- a) initiate action to prevent the occurrence of product non-conformity;
- b) identify and record any product quality problems.

4.2.2 Management representative for factory production control

The manufacturer shall appoint a management representative who, irrespective of other responsibilities, shall have defined authority and responsibility for ensuring that the requirements of this document are implemented and maintained.

4.2.3 Management review

The production control system shall be reviewed by the manufacturer's management at appropriate intervals in accordance with the manufacturer's control system to ensure its continuing suitability and effectiveness. Records of such reviews shall be maintained for a minimum period of 10 years.

4.3 Factory production control system

4.3.1 General

The manufacturer shall establish and maintain a documented system as a means of ensuring that the product conforms to EN 1279. The following requirements shall be fulfilled.

4.3.2 Personnel

The manufacturer shall use appropriately trained personnel for the operation and inspections of all production and inspection equipment.

4.3.3 Documentation

The manufacturer's documentation and procedures shall be relevant to the production and process control of the IGU, and shall be adequately described in the manual which shall include:

- a) The organizational structure, responsibilities and authorities of the management with regard to product conformity.
- b) The procedures for specifying and verifying the incoming materials.
- c) The manufacturing, production control and other techniques, processes and systematic actions that will be used.
- d) The inspections that will be carried out before production, the inspections and tests during and after production, and the frequency at which they will be carried out.
- e) Required records of the inspections, test and assessments.
- f) Non-conformity situations requiring corrective action and the action taken.

4.4 Equipment

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4.4.1 Testing

All weighing, measuring and testing equipment shall be calibrated and regularly inspected according to documented procedures, frequencies and criteria.

NOTE The precision of calibration required is implied by the accuracy of the test method and tolerances specified.

4.4.2 Manufacturing

All equipment used in the manufacturing process shall be regularly inspected and maintained to ensure that use, wear or failure does not cause inconsistency in the manufacturing process. Inspections and maintenance shall be carried out and recorded in accordance with the manufacturer's written procedures and the records retained for the period defined in the manufacturer's FPC procedures.

4.4.3 Inspection and testing

Subclause A.2 designates the inspections and tests by means of tables. The requirements and records shall be normative.

Frequencies shall be regarded as recommended minimum frequency.

4.4.4 Non-complying materials / products

The manufacturer shall have written procedures which specify how non-complying materials / products shall be dealt with.

Action shall be taken so that:

- non-conforming raw materials cannot be used;
- non-conforming products cannot be delivered.

Annex A (normative)

Inspection and testing tables of insulating glass units

A.1 General

The inspection and tests are given in Table A.1 and the random sample inspection plan are detailed in Table A.2.

Table A.1 — Required Inspection and tests for particular designs of IGUs and for particular designs of components for IGUs

Inspection table	A.3	A.4	A.5	A.6	A.7	A.8	A.9	A.10	A.11	A.12
IGU systems ^a	All	Gas filled	Outer seal		Inner seal	spacer				
			Cold	Hot		Rigid hollow	Hot applied ^b	Prefabricated ^b	U-channel	Metal strip
B2	X	WR	X	X	X	X				
B3	X	WR	WR	WR			X			
B4	X	WR	X	X	WR			X		
B5	X	WR	X	X	WR				X	
B6	X									X

X: mandatory, WR: where relevant,
^a: for systems of IGUs, refer to EN 1279-1:2018, Annex B.
^b: in the case the hot applied flexible spacer is also a prefabricated flexible spacer, both tables shall be applied

Table A.2 — Reference random sample inspection plan for finished IGUs (control plan to be made by the manufacturer)

Lot or day's production	Number of test pieces for inspections
2 – 15	2
16 – 25	3
26 – 90	5
91 – 150	8
151 – 500	13
501 – 1 200	20
1 201 – 9 999	32

The Tables A.3 to A.12 deal with a particular design; each table consists of three parts:

- first section: Material control;
- second section: Production Control;
- third section: Product control.

When a manufacturing process is such that one or more of the listed inspections or tests are not applicable or physically not practical, the concerned inspection or test may be ignored.

The inspections and/or tests on incoming materials shall be carried out before use.

The required records in Tables A.3 to A.12 may be any document such as order documents, production documents, logbook, etc, as described in the FPC procedures and associated documentation.

The information of the component supplier shall be supplied following EN 10204, type 3.1/Table A.1 or ISO/IEC 17050-1 and ISO/IEC 17050-2.

For those criteria where no record is required this situation shall only apply until a complaint regarding those criteria is received. Records shall subsequently be kept to show that corrective action has been successful.

The machinery and equipment used for manufacturing the products shall be checked at periods consistent with the manufacturers' documented process control against defined parameters, maintained and adjusted for optimal results.

A.2 Specific requirements iTech STANDARD PREVIEW (standards.itech.ai)

Due to the nature of some incoming materials and components, the manufacturer has to carry out some tests simultaneously to production, if sufficient controls are incorporated into the FPC to allow change/replacement if a test failure occurs.

Inspections in product control section can be performed during production, if the FPC contains the relevant instructions.

The product control section of the tables refer to the reference random sample inspection plan in Table A.2.

NOTE Plans with the same statistical accuracy (e.g. based on ISO 2859-1) can be used.

When the inspection of a lot or a day's production reveals more than the acceptable number of occurrences which exceed the absolute limits described in the system description in accordance with EN 1279-1:2018, all the IGUs of the lot or day's production shall be re-inspected. Any IGUs which exceed the absolute limit(s) shall be repaired or re-manufactured. The control plan shall be made by the manufacturer.

When a manufacturing process is such that one or more of the listed inspections or tests are not applicable or physically not possible, the relevant inspection or test shall be adapted or ignored. In such case any adaption or omission shall be documented in the FPC with justification.

A.3 Use of proxy testing

A manufacturer may employ a test method/method of evaluation other than those referred to in Tables A.1 and A.2. However, it shall be the manufacturer's responsibility to prepare suitable documentation describing such tests and their correlation with the recommended method to ensure that the appropriate characteristic is as declared.

EN 1279-6:2018 (E)

Table A.3 — Inspection and test table for all units

Section 1: Material Control					
Ref.	Material, inspection or test	Recommended method (decision by manufacturer)	Requirement	Recommended frequency (decision by manufacturer)	Record
1	Glass				
1.1	Packaging and label	Visual	See purchase specification	Each batch	No
1.2	Identification (glass/coated glass, according to relevant standards)	Visual	See purchase specification	Each batch	Yes
1.3	Dimensions (length/width/shape/thickness when applicable)	Measurement	See purchase specification	Each batch: 1 sample	No
2	Inserts of any kind				
2.1	Packaging and label	Visual	See purchase specification	Each batch	No
2.2	Dimensions	Measurement	See purchase specification	Each batch: 2 samples/type	Yes
2.3	Appearance	Visual	See purchase specification	Each batch: 1 sample/type	Yes
2.4	Volatile content (only if no information from supplier is available)	See EN 1279-4:2018, Annex H	See purchase specification	Each batch: 2 samples/type	Yes
3	Leaded light strip				
3.1	Packaging and label	Visual	See purchase specification	Each batch: 1	No
3.2	Dimensions	Measurement	See purchase specification	Each batch: 2 samples	Yes
3.3	Adhesion	Adhesion test (Annex C)	See purchase specification	Each batch: 2 samples	Yes
3.4	Volatile content (only if no information from supplier is available)	See EN 1279-4:2018, Annex H	See purchase specification	Each batch: 2 samples	Yes

4	Marking materials				
4.1	Packaging and label	Visual	See purchase specification	Each batch: 1	No
5	Cutting oil				
5.1	Packaging and label	Visual	See purchase specification	Each batch: 1	No
6	Washing machine additive				
6.1	Packaging and label	Visual	See purchase specification	Each batch: 1	No
Section 2: Production control					
Ref.	Material, inspection or test	Recommended method (decision by manufacturer)	Requirement	Recommended frequency (decision by manufacturer)	Record
1	Cutting of glass (if relevant)				
1.1	Type of glass	Visual	See relevant specifications	Each pane	No
1.2	Cutting quality	Visual	See relevant specifications	Each pane	No
1.3	Dimensions	Measurement	See relevant specifications	1 pane/shift and line	Yes
1.4	Thickness	Visual	See relevant specifications	Each pane	No
1.5	Edge deletion (when and if relevant)	visual	See relevant specifications	Each pane	No
2	Washing efficiency				
2.1	Quality of rinsing water	Resistivity / conductivity	See internal specification	1 per shift and machine	No
2.2	Dry and clean glass edge and surface	Visual	No visible contamination	Each pane	No
3	Assembly				
3.1	Glass components or type of used glasses	Visual	See label	Random inspection plan (Table A.2)	No
3.2	Glass defects	visual	See EN 1279-1:2018, Annex F	Random inspection plan (Table A.2)	No
3.3	Position of spacer frame	Visual	See system description	Each IGU	No