



SLOVENSKI STANDARD

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Steklo v gradbeništvu - HS-preskus kaljenega zemljoalkalijskega silikatnega varnostnega stekla - 2. del: Vrednotenje skladnosti/standard za izdelek

Glass in building - Heat soaked thermally toughened alkaline earth silicate safety glass - Part 2: Evaluation of conformity/Product standard

Glas im Bauwesen - Heißgelagertes thermisch vorgespanntes Erdalkali-Silicat-Einscheibensicherheitsglas - Teil 2: Konformitätsbewertung/Produktnorm

Verre dans la construction - Verre de silicate alcalinoterreux de sécurité trempé et traité Heat Soak - Partie 2 : Evaluation de la conformité/Norme de produit

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EUROPEAN STANDARD
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EN 15682-2

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**Glass in building - Heat soaked thermally toughened alkaline
earth silicate safety glass - Part 2: Evaluation of
conformity/Product standard**

Verre dans la construction - Verre de silicate alcalinoterreux
de sécurité trempé et traité Heat Soak - Partie 2 :
Evaluation de la conformité/Norme de produit

Glas im Bauwesen - Heißgelagertes thermisch
vorgespanntes Erdalkali-Silicat-Einscheibensicherheitsglas
- Teil 2: Konformitätsbewertung/Produktnorm

This European Standard was approved by CEN on 30 May 2013.

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EN 15682-2:2013 (E)

Foreword

This document (EN 15682-2:2013) has been prepared by Technical Committee CEN/TC 129 "Glass in Building", the secretariat of which is held by IBN.

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of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

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

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

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

EN 15682 is composed of the following parts:

- EN 15682-1, *Glass in building — Heat soaked thermally toughened alkaline earth silicate safety glass — Part 1: Definition and description*
- EN 15682-2, *Glass in building — Heat soaked thermally toughened alkaline earth silicate safety glass — Part 2: Evaluation of conformity/Product standard*

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard specifies requirements, the evaluation of conformity and the factory production control of flat heat soaked thermally toughened alkaline earth silicate safety glass for use in buildings.

For glass products with electrical wiring or connections for, e.g. alarm or heating purposes, other directives, e.g. Low Voltage Directive, may apply.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 356, *Glass in building — Security glazing — Testing and classification of resistance against manual attack*

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

EN 673, *Glass in building — Determination of thermal transmittance (U value) — Calculation method*

EN 1063, *Glass in building — Security glazing — Testing and classification of resistance against bullet attack*

EN 1096-1, *Glass in building — Coated glass — Part 1: Definitions and classification*

EN 1096-2, *Glass in building — Coated glass — Part 2: Requirements and test methods for class A, B and S coatings*

EN 1096-3, *Glass in building — Coated glass — Part 3: Requirements and test methods for class C and D coatings*

EN 1288-3, *Glass in building — Determination of the bending strength of glass — Part 3: Test with specimen supported at two points (four point bending)*

EN 12600, *Glass in building — Pendulum test — Impact test method and classification for flat glass*

EN 12758, *Glass in building — Glazing and airborne sound insulation — Product descriptions and determination of properties*

EN 12898, *Glass in building — Determination of the emissivity*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13501-2, *Fire classification of construction products and building elements — Part 2: Classification using data from fire resistance tests, excluding ventilation services*

EN 13501-5, *Fire classification of construction products and building elements — Part 5: Classification using data from external fire exposure to roof tests*

EN 13541, *Glass in building — Security glazing — Testing and classification of resistance against explosion pressure*

EN 14178-1, *Glass in building — Basic alkaline earth silicate glass products — Part 1: Float glass*

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EN 15682-1:2013, *Glass in building — Heat soaked thermally toughened alkaline earth silicate safety glass — Part 1: Definition and description*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 15682-1:2013 and the following apply.

3.1 initial type testing
determination of the performance of a product (characteristic, durability), on the basis of either actual tests or other procedures (such as conventional, standardised, tabulated or general accepted values, standardised or recognised calculation methods, test reports when made available, ...), in accordance with this document that demonstrates compliance with this document

3.2 test report
document that covers the results of tests undertaken on a representative sample of the product from production or on a prototype design of the product

3.3 product description
document that details the relevant parameters, e.g. process conditions, structure, etc., for defining a product that complies with the standard and which includes specific reference(s) to characteristics that are modified by the production process

3.4 significant change
variation in performance beyond the permitted tolerance for the characteristic

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4 Requirements**4.1 Product description**

For conformity purposes the heat soaked thermally toughened alkaline earth silicate glass manufacturer is responsible for the preparation and maintenance of the product description. This description shall describe the product and/or product families.

Disclosure of the product description shall be at the discretion of the heat soaked thermally toughened alkaline earth silicate glass manufacturer or his agent except in the case of regulatory requirements.

The description shall contain at least a normative part. The description may also contain an informative part, when the manufacturer foresees further development of the product.

The normative part of the description shall contain the following minimum information:

- a reference to EN 15682-1 and EN 15682-2 and all other standards with which the manufacturer claims compliance;
- the spectrophotometric properties and durability of coated glass, i.e. coated glass that conforms with EN 1096-1, EN 1096-2, EN 1096-3, when those properties are changed, intentionally or unintentionally, by the thermal toughening and heat soaking process.

The definition of product families shall be consistent with the normative part of the product description.

The substitution of materials shall maintain the conformity with the product description. The substituting material can be added to the product family and also the product description when compliance has been demonstrated.

4.2 Conformity with the definition of heat soaked thermally toughened alkaline earth silicate safety glass

Products shall conform to the definition and fulfil the requirements of heat soaked thermally toughened alkaline earth silicate safety glass as defined in EN 15682-1.

4.3 Determination of the characteristic's performances

4.3.1 Characteristics of heat soaked thermally toughened alkaline earth silicate safety glass

4.3.1.1 General

The characteristics of heat soaked thermally toughened alkaline earth silicate safety glass are in general those of the glass substrate (see 4.3.1.2).

4.3.1.2 Characteristics of the alkaline earth silicate glass panes used for the production of heat soaked thermally toughened alkaline earth silicate safety glass

Panels shall be made of alkaline earth silicate glass according to EN 14178-1. The panes can be coated according to EN 1096-1, EN 1096-2, EN 1096-3 and/or enamelled according to EN 15682-1.

For the characteristics listed in Table 1, for the alkaline earth silicate glass panes, generally accepted values or calculated values shall be used.

Since the majority of the characteristics of Table 1 are not changed significantly by the thermal toughening process they shall be used for heat soaked thermally toughened alkaline earth silicate safety glass. The exceptions being the characteristic bending strength $f_{g,k}$ and the resistance against sudden temperature changes and temperature differentials.

Table 1 — Information on the characteristics of alkaline earth silicate glass panes, according to EN 14178-1, used for the production of heat soaked thermally toughened alkaline earth silicate safety glass

Characteristic	Symbol	Unit
- Density	ρ	kg/m ³
- Hardness (Knoop)	HK _{0,1/20}	GPa
- Young's modulus	E	Pa
- Poisson's ratio	μ	Dimensionless
- Characteristic bending strength	$f_{g,k}$	Pa
- Resistance against sudden temperature changes and temperature differentials		K
- Specific heat capacity	c	J/(kg·K)
- Coefficient of linear expansion	α	K ⁻¹
- Thermal conductivity (for U -value)	λ	W/(m·K)
- Mean refractive index to visible radiation	n	Dimensionless
- Emissivity	ε	Dimensionless
- Light transmittance	τ_v	Dimensionless
- Solar direct transmittance	τ_e	Dimensionless
- Total energy transmittance	τ_g	Dimensionless

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If some coatings, i.e. coated glass conforming with the EN 1096 series, when heat soaked thermally toughened change their radiometric properties – the manufacturer shall refer to the following for the determination of the appropriate characteristics, etc.:

- 4.3.2.12 for the emissivity;
- 4.3.2.13 for the light transmittance and reflectance;
- 4.3.2.14 for the solar energy transmittance;
- EN 1096-2 for the durability of A, B and S coatings;
- EN 1096-3 for the durability of C and D coatings.

4.3.2 Determination of characteristics of heat soaked thermally toughened alkaline earth silicate safety glass products

4.3.2.1 General

If the heat soaked thermally toughened alkaline earth silicate glass manufacturer wishes to claim that any performance characteristic is independent of the production equipment used then the factory production control system shall be in accordance with this document including his specific process control conditions.

4.3.2.2 Safety in the case of fire - Resistance to fire

Fire resistance shall be determined and classified in accordance with EN 13501-2.

4.3.2.3 Safety in the case of fire - Reaction to fire

Reaction to fire shall be determined and classified in accordance with EN 13501-1.

Heat soaked thermally toughened alkaline earth silicate safety glass products are products/materials that do not require to be tested for reaction to fire (e.g. Products/materials of Classes A1 according to Commission Decision 96/603/EC, as amended by 2000/605/EC).

4.3.2.4 Safety in the case of fire - External fire behaviour

Where the manufacturer wishes to declare external fire performance (e.g. when subject to regulatory requirements), the product shall be tested in accordance with EN 13501-5.

4.3.2.5 Safety in use - Bullet resistance: shatter properties and resistance to attack

Bullet resistance shall be determined and classified in accordance with EN 1063.

4.3.2.6 Safety in use - Explosion resistance: impact behaviour and resistance to impact

Explosion resistance shall be determined and classified in accordance with EN 13541.

4.3.2.7 Safety in use - Burglar resistance: shatter properties and resistance to attack

Burglar resistance shall be determined and classified in accordance with EN 356.

4.3.2.8 Safety in use - Pendulum body impact resistance: shatter properties (safe breakability) and resistance to impact

Pendulum body impact resistance shall be determined and classified in accordance with EN 12600.

4.3.2.9 Safety in use - Mechanical resistance: Resistance against sudden temperature changes and temperature differentials

The resistance against sudden temperature changes and temperature differentials is a generally accepted value that is given in EN 15682-1 and shall be ensured by compliance with this document.

4.3.2.10 Safety in use - Mechanical resistance: Resistance against wind, snow, permanent load and/or imposed loads of the glass unit

The mechanical strength/profile bending strength of heat soaked thermally toughened alkaline earth silicate safety glass is a characteristic value that is given in EN 15682-1 and shall be ensured by compliance with this document.

As long as on the concerned construction or building site no part of prEN 16612 is applicable then the current method available in the country of destination shall be applied.

The manufactured or supplied thickness of heat soaked thermally toughened alkaline earth silicate safety glass shall conform to the ordered thickness.

4.3.2.11 Protection against noise - Direct airborne sound reduction

The sound reduction indexes shall be determined in accordance with EN 12758. However, the information supplied with the incoming glass can be used as the thermal toughening and heat soaking process does not alter the values.

EN 15682-2:2013 (E)**4.3.2.12 Energy conservation and heat retention - Thermal properties**

The thermal transmittance value (U -value) shall be determined by calculation in accordance with EN 673 with:

- emissivity ε : the declared value of the glass manufacturer; if the information is not available, the emissivity shall be determined in accordance with EN 12898;
- nominal thickness of the glass panes.

However, the information supplied about the thermal properties of the incoming glass can be used if the thermal toughening and heat soaking process does not alter the values.

4.3.2.13 Energy conservation and heat retention - Radiation properties: Light transmittance and reflectance

The light transmittance and reflectance shall be determined in accordance with EN 410.

However, the information supplied about the radiation properties of the incoming glass can be used if the thermal toughening and heat soaking process does not alter the values.

4.3.2.14 Energy conservation and heat retention - Radiation properties: Solar energy characteristics

The solar energy transmittance and reflectance shall be determined in accordance with EN 410.

However, the information supplied about the radiation properties of the incoming glass can be used if the thermal toughening and heat soaking process does not alter the values.

4.4 Durability

When products conform to the definition of heat soaked thermally toughened alkaline earth silicate glass as 4.2, then the characteristics' performances in 4.3.2 are ensured during an economically reasonable working life.

The durability of glass products, including their characteristics, is ensured by the following:

- compliance with this standard;
- compliance with instructions from the glass product manufacturer or supplier.

The manufacturer shall supply specific installation instructions or make reference to appropriate technical specifications.

NOTE Also the durability of glass products depends on:

- building and construction movements due to various actions;
- building and construction vibrations due to various actions;
- deflection and racking of the glass support due to various actions;
- glass support design (e.g. drainage of infiltrated water in the rebate, prevention of direct contact between glass support members and glass);
- accuracy of glass support and glass support member dimensions;
- quality of the assembling of glass support members up to a glass support;