
Steklo v gradbeništvu - Toplotno kaljeno natrij-kalcijevo silikatno utorjeno varnostno steklo - 2. del: Ovrednotenje skladnosti/standard za izdelek

Glass in building - Thermally toughened soda lime silicate channel shaped safety glass - Part 2: Evaluation of conformity/Product standard

Glas im Bauwesen - Thermisch vorgespanntes Kalknatron-Profilbau-Sicherheitsglas - Teil 2: Konformitätsbewertung/Produktnorm

Verre dans la construction - Verre de silicate sodocalcique profilé de sécurité trempé thermiquement - Partie 2 : Evaluation de la conformité/Norme de produit

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Glass in building - Thermally toughened soda lime silicate channel shaped safety glass - Part 2: Evaluation of conformity/Product standard

Verre dans la construction - Verre de silicate sodo-calcique
profilé de sécurité trempé thermiquement - Partie 2 :
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Glas im Bauwesen - Thermisch vorgespanntes Kalknatron-
Profilbau-Sicherheitsglas - Teil 2:
Konformitätsbewertung/Produktnorm

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

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COMITÉ EUROPÉEN DE NORMALISATION
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| Contents | Page |
|---|-------------|
| Foreword..... | 4 |
| 1 Scope | 5 |
| 2 Normative references | 5 |
| 3 Terms and definitions | 6 |
| 4 Requirements | 6 |
| 4.1 Product description | 6 |
| 4.2 Conformity with the definition of thermally toughened soda lime silicate channel shaped safety glass | 7 |
| 4.3 Determination of the performances of characteristics | 7 |
| 4.3.1 Characteristics of thermally toughened soda lime silicate channel shaped safety glass | 7 |
| 4.3.2 Determination of characteristics of thermally toughened soda lime silicate channel shaped safety glass products | 8 |
| 4.4 Durability | 10 |
| 4.5 Dangerous substances | 11 |
| 5 Evaluation of conformity | 11 |
| 5.1 General..... | 11 |
| 5.2 Initial type testing of the product (see 5.1, b)) | 11 |
| 5.2.1 General..... | 11 |
| 5.2.2 Initial type testing of thermally toughened soda lime silicate channel shaped safety glass | 13 |
| 5.2.3 Initial type testing of characteristic's performances | 15 |
| 5.3 Factory production control and inspection of samples in accordance with a prescribed test plan (see 5.1, a) 1) and 2) | 15 |
| 5.4 Initial inspection of factory and of factory production control (see 5.1, a) 2) | 16 |
| 5.5 Continuous surveillance and assessment of the factory production control (see 5.1, a) 3) | 16 |
| 6 Marking and labelling | 17 |
| 6.1 General..... | 17 |
| 6.2 Product marking | 17 |
| 6.3 Product characteristics | 17 |
| 6.4 "Characteristic/performance identification paper" | 17 |
| Annex A (normative) Factory production control | 18 |
| A.1 Factory production control requirements | 18 |
| A.1.1 General..... | 18 |
| A.1.2 Organisation..... | 18 |
| A.1.3 Control system..... | 18 |
| A.2 Marking | 19 |
| A.3 Inspection and testing tables of thermally toughened soda lime silicate channel shaped safety glass production | 19 |
| A.3.1 Information to the Table A.1 | 19 |
| A.3.2 Product control | 20 |
| A.3.3 Use of proxy testing | 20 |
| Annex B (informative) Tests for factory production control | 24 |
| B.1 Fragmentation test | 24 |
| B.1.1 Requirements | 24 |
| B.1.2 Test method..... | 24 |
| Annex C (informative) Provisions for voluntary involvement of third party(ies)..... | 25 |
| C.1 General..... | 25 |
| C.2 Voluntary tasks for third parties | 25 |

| | | |
|-----------------|--|-----------|
| C.3 | Marking and labelling | 25 |
| Annex ZA | (normative) Clauses of this European Standard addressing the provisions of EU Construction Products Directive | 26 |
| ZA.1 | Scope and relevant characteristics | 26 |
| ZA.2 | Procedure(s) for the attestation of conformity of thermally toughened soda lime silicate channel shaped safety glass products | 28 |
| ZA.2.1 | System(s) of attestation of conformity | 28 |
| ZA.2.2 | EC Certificate and Declaration of Conformity | 31 |
| ZA.3 | CE marking and labelling | 32 |
| | Bibliography | 35 |

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<https://standards.iteh.ai/catalog/standards/sist/814f9aef-c1af-4a58-a7f6-9f527a22880f/sist-en-15683-2-2014>

EN 15683-2:2013 (E)**Foreword**

This document (EN 15683-2:2013) 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 June 2014, and conflicting national standards shall be withdrawn at the latest by June 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 Directives.

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

EN 15683 is composed of the following parts:

- EN 15683-1, *Glass in building — Thermally toughened soda lime silicate channel shaped safety glass — Part 1: Definition and description*
- EN 15683-2, *Glass in building — Thermally toughened soda lime silicate channel shaped safety glass — Part 2: Evaluation of conformity/Product standard*

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, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard covers the evaluation of conformity and the factory production control of thermally toughened soda lime silicate channel shaped safety glass for use in buildings.

This also includes requirements subject to regulation.

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 572-1, *Glass in building — Basic soda lime silicate glass products — Part 1: Definitions and general physical and mechanical properties*

EN 572-7, *Glass in building — Basic soda lime silicate glass products — Part 7: Wired or unwired channel shaped glass*

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 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 roofs tests*

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

EN 15683-1:2013, *Glass in building — Thermally toughened soda lime silicate channel shaped safety glass — Part 1: Definition and description*

EN 15683-2:2013 (E)**3 Terms and definitions**

For the purpose of this document, the terms and definitions given in EN 15683-1:2013 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

3.5**plank**

length of channel shaped glass

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4 Requirements**4.1 Product description**

For conformity purposes, the thermally toughened soda lime silicate channel shaped 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 thermally toughened 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 15683-1 and EN 15683-2 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 and EN 1096-2, when those properties are changed, intentionally or unintentionally, by the thermal toughening 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 thermally toughened soda lime silicate channel shaped safety glass

Products shall conform to the definition and fulfil the requirements of thermally toughened soda lime silicate channel shaped safety glass as defined in EN 15683-1.

4.3 Determination of the performances of characteristics

4.3.1 Characteristics of thermally toughened soda lime silicate channel shaped safety glass

4.3.1.1 General

The characteristics of thermally toughened soda lime silicate channel shaped safety glass are those of the glass substrate (see 4.3.1.2).

4.3.1.2 Characteristics of channel shaped glass used for thermally toughened soda lime silicate channel shaped safety glass

Planks shall be made of unwired channel shaped glass products according to EN 572-1 and EN 572-7. The panes may be coated according to EN 1096-1 and EN 1096-2, and/or enamelled according to EN 15683-1.

For the characteristics listed in Table 1, for thermally toughened soda lime silicate channel shaped safety glass, 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 thermally toughened soda lime silicate channel shaped safety glass. The exceptions shall be the characteristic bending strength $f_{g,k}$ and the resistance against sudden temperature changes and temperature differentials.

EN 15683-2:2013 (E)

Table 1 — Information on the characteristics of basic channel shaped glass, according to EN 572-1, used for the production of thermally toughened soda lime silicate channel shaped safety glass

| Characteristic | Symbol | Unit |
|---|----------------------|-------------------|
| - Density | ρ | kg/m ³ |
| - Hardness (knoop hardness in accordance with ISO 9358) | 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 | g | Dimensionless |

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

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- 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.

4.3.2 Determination of characteristics of thermally toughened soda lime silicate channel shaped safety glass products

4.3.2.1 General

If the thermally toughened 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.

Thermally toughened soda lime silicate channel shaped 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 and classified 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.

NOTE Thermally toughened soda lime silicate channel shaped glass will usually not be classified as bullet resistant.

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.

NOTE Thermally toughened soda lime silicate channel shaped glass will usually not be classified as explosion resistant.

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.

NOTE Thermally toughened soda lime silicate channel shaped glass will usually not be classified as burglar resistant.

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

SIST EN 15683-2:2014

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

NOTE Thermally toughened soda lime silicate channel shaped glass cannot be classified for pendulum body impact resistance as the test method only applies to flat glass.

A system incorporating thermally toughened soda lime silicate channel shaped glass may be tested and impact performance determined.

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 15683-1 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 thermally toughened soda lime silicate channel shaped safety glass is a characteristic value that is given in EN 15683-1 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 for the design, then the current method of determining mechanical resistance in the country of destination shall be applied.

The manufactured or supplied type, i.e. thickness, width and flange height, and length (H) of thermally toughened soda lime silicate channel shaped safety glass shall conform to the ordered type and length (H).

EN 15683-2:2013 (E)**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 may be used as the thermal toughening process does not alter the values.

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.

Subject to 5.2.1, the information supplied about the thermal properties of the incoming glass may be used if the thermal toughening 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.

Subject to 5.2.1, the information supplied about the radiation properties of the incoming glass may be used if the thermal toughening 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.

Subject to 5.2.1, the information supplied about the radiation properties of the incoming glass can be used if the thermal toughening process does not alter the values.

4.4 Durability

When products conform to the definition of thermally toughened soda lime silicate channel shaped safety 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, shall be ensured by the following:

- compliance with this document;
- 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 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);