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

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ICS

English Version

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

This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 129.

If this draft becomes a European Standard, 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.

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COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This document (prEN 15683-2:2007) has been prepared by Technical Committee CEN/TC 129 “Glass in building”, the secretariat of which is held by NBN.

This document is currently submitted to the CEN Enquiry.

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.

This Part of the European Standard does not stand alone, it is a part of one standard:

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*

This document contains other aspects of importance of trade.

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1 Scope

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

NOTE This also includes requirements subject to regulation.

2 Normative references

The following referenced documents are indispensable for the application 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 356, *Glass in Building – Security glazing – Testing and classification of resistance against manual attack.*

EN 410, *Glass in Building – 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 572-7, *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 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*
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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.*

prEN 13474 (all parts), *Glass in building – Design of glass panes.*

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

EN 13501-2, *Fire classification of construction products and building elements – Part 2: Classification using test data from fire resistance tests.*

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

EN 13541, *Glass in Building – Security glazing – Testing and classification of resistance against explosion pressure.*

EN 15683-1:2007, *Glass in Building – Thermally toughened soda lime silicate channel shaped safety glass – Part 1: Definition and description.*

3 Terms and definitions

For the purpose of this document, the terms and definitions given in EN 15683-1:2007 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. It 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
a 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 Parts 1 and 2 and all other standards with which the manufacturer claims compliance.
- the radiometric 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 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 may 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.

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Table 1 — Information on the characteristics of basic channel shaped glass, according to EN 14178-1, used for the production of thermally toughened soda lime silicate channel shaped safety glass

Characteristic	Symbol	Unit
- Density	ρ	kg/m ³
- Hardness	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.:

- 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.

NOTE EN 357 may be used as a classification reference specific to fire resistant glazed elements.

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 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

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

NOTE 1 Thermally toughened soda lime silicate channel shaped glass can not be classified for pendulum body impact resistance as the test method only applies to flat glass.

NOTE 2 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 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 13474 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).

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;