



SLOVENSKI STANDARD

SIST EN 14178-1:2005

01-marec-2005

**Steklo v stavbah - Osnovni izdelki iz zemljoalkalijskega silikatnega stekla – 1. del:
Ravno steklo**

Glass in building - Basic alkaline earth silicate glass products - Part 1: Float glass

Glas im Bauwesen - Basiserzeugnisse aus Erdalkali-Silicatglas - Teil 1: Floatglas

Verre dans la construction - Verre de silicate alcalinoterreux de base - Partie 1: Glace
flottée

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ICS:

81.040.20 Steklo v gradbeništvu Glass in building

SIST EN 14178-1:2005 **en**

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EUROPEAN STANDARD
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English version

Glass in building - Basic alkaline earth silicate glass products - Part 1: Float glass

Verre dans la construction - Verre de silicate alcalinoterreux
de base - Partie 1: Glace flottée

Glas im Bauwesen - Basiserzeugnisse aus Erdalkali-
Silicatglas - Teil 1: Floatglas

This European Standard was approved by CEN on 27 May 2004.

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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 Central Secretariat has the same status as the official versions.

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

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Foreword

This document (EN 14178-1:2004) has been prepared by Technical Committee CEN/TC 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of an identical text or by endorsement, at the latest by April 2005, and conflicting national standards shall be withdrawn at the latest by April 2005.

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, B, C or D, which is an integral part of this document can be found in EN 14178-2.

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

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EN 14178-1:2004 (E)

1 Scope

This document defines and classifies basic alkaline earth silicate glasses for use in building. It indicates their chemical composition, main physical and mechanical properties, dimensional and minimum quality requirements (in respect of optical and visual faults).

This document applies to basic alkaline earth silicate glasses supplied in jumbo sizes, split sizes and final cut sizes.

This document does not apply to final cut sizes having a dimension less than 100mm or a surface area less than 0,05m².

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1

basic alkaline earth silicate glass

flat, transparent, clear or tinted float glass with a chemical composition according to 4.1 of this document, having parallel and polished faces obtained by continuous casting and floatation on a metal bath

3.2

length, H, and width, B

these are defined with reference to the direction of draw of the float glass ribbon as shown in Figure 1

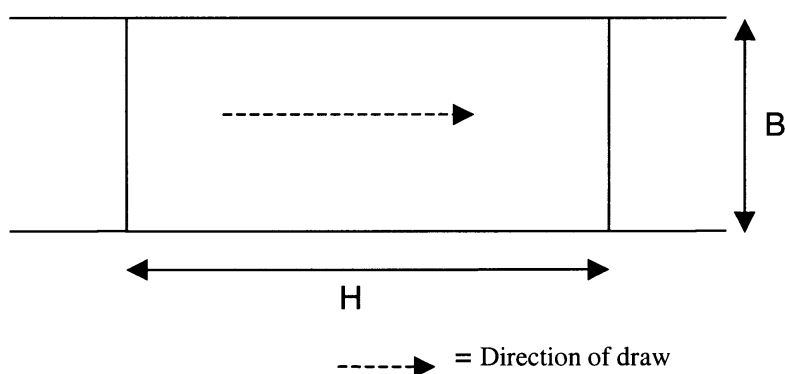


Figure 1 — Relationship between length, width and direction of draw

3.3

jumbo sizes

glass delivered in the following sizes:

Nominal length H : 4500 mm, 5100 mm or 6000 mm

Nominal width B : 3210 mm

NOTE The usual width is 3210 mm. Exceptional production requirements may cause this to be reduced but the nominal width is never below 3150 mm

3.4

split sizes

glass delivered in the following size ranges:

Nominal length H : 1000 mm to 2550 mm

Nominal width B : 3210 mm

NOTE The usual width is 3210 mm. Exceptional production requirements may cause this to be reduced but the nominal width is never below 3150 mm.

3.5

final cut size

pane of glass that has been cut down to the dimensions being required either for installation or processing into a final product e.g. insulating glass units, thermally toughened safety glass, ...of those dimensions

3.6

optical faults

these are faults that lead to distortions in the appearance of objects observed through the glass

3.7

visual faults

faults, which alter the visual quality of the glass. They are spot faults and linear / extend faults

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3.8

spot faults

a spot fault is a nucleus, which is sometimes accompanied by a halo of distorted glass. The dimension of a spot fault comprising a nucleus with a halo is obtained by multiplying the dimension of the nucleus by a factor of approximately 3

3.9

linear / extended faults

these faults can be on or in the glass, in the form of deposits, marks or scratches that occupy an extended length or area

3.10

edge defects

these defects can occur on the edge of a cut size piece in the form of entrant and emergent faults and / or bevels

4 Chemical composition

4.1 Principal constituents

The magnitude of the proportions by mass of the principal constituents of all the alkaline earth silicate glass products covered by this document is as follows:

Silicon Dioxide	SiO ₂	55 - 70 %
Calcium Oxide	CaO	3 - 12%

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Potassium Oxide	K ₂ O	5- 14%
Aluminium Oxide	Al ₂ O ₃	0 - 15 %
Zirconium Oxide	ZrO ₂	0– 8 %
Strontium Oxide	} SrO	} 1– 15 %
Barium Oxide		
Others		0 – 10 %

4.2 Tint

Body tinted glass is obtained by the addition of suitable materials.

5 Physical and mechanical characteristics

5.1 General characteristics

Conventional numerical values for the physical and mechanical characteristics of basic alkaline earth silicate glass products are given in Table 1. These values, for normal annealed glass without any further toughening, are not precise requirements with which the glass shall strictly comply, but are the generally accepted figures for use in calculations where a high degree of accuracy is not required.

Table 1 — General characteristic values of alkaline earth silicate glass

Characteristic	Symbol	Value and unit
Density (at 18°C)	ρ	2700 kg/m ³
Hardness (Knoop)	HK _{0,1/20}	5 – 6 Gpa
Young's modulus (modulus of elasticity)	E	7,7 x 10 ¹⁰ Pa
Poisson's ratio	μ	0,2
Characteristic bending strength	$f_{g,kk}$	45 x 10 ⁶ Pa ^[1]
Specific heat capacity	c_p	0,7 x 10 ³ J/(kg K)
Nominal value of average coefficient of linear expansion between 20 °C and 300 °C	α	8 x 10 ⁻⁶ /K
Resistance against temperature differential and sudden temperature change		40 K ^[2]
Thermal conductivity	λ	0,8 - 1,1 W/(m K)
Mean refractive index to visible radiation (at 589,3 nm)	n	1,5

Corrected emissivity	ϵ	0,837
[1] The characteristic bending strength has to be used in conjunction with the design method given in prEN 13474		
[2] Generally accepted value that is influenced by edge quality and glass type		

5.2 Designation of clear alkaline earth silicate glass

An earth alkaline silicate glass product is defined as clear alkaline earth silicate glass when it is not tinted and when the light transmittance of the glass material, unmodified by the possible presence of a coating:

- after any necessary pre-treatment
- measured according to EN 410
- rounded to the nearest 0,01

is greater than or equal to the value given in Table 2 for the nominal thickness of the alkaline earth silicate glass product.

In order to measure the light transmittance characteristics of alkaline earth silicate glass, to determine whether it can be classified as clear, it is necessary, in some cases, to carry out a pre-treatment:

- coatings on smooth surfaces have to be eliminated, without modifying the thickness of the alkaline earth silicate glass substrate.

The light transmittance of an alkaline earth silicate glass substrate has to be measured with its surfaces in a polished condition.

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Table 2 — Mean values for determining if a transparent alkaline earth silicate glass product is clear

Nominal thickness in mm	Mean value ^(1,2)
2	0,90
3	0,90
4	0,90
5	0,89
6	0,89
8	0,88
10	0,87
12	0,86
15	0,84

¹⁾ The limiting values given are applicable provided that the measured thickness of the alkaline earth silicate glass product is within the allowable tolerances for the nominal thickness of that product.

²⁾ The values given are not suitable for design. They are values used only for the definition of clear alkaline earth silicate glass and exclude the effects of coatings. The values of light transmittance used for design should be obtained from the glass manufacturer, measured according to EN 410.