SLOVENSKI STANDARD
oSIST prEN 13024-1:2018

01-maj-2018

Steklo v gradbeništvu - Kaljeno borosilikatno varnostno steklo - 1. del: Definicija in opis

Glass in building - Thermally toughened borosilicate safety glass - Part 1: Definition and description

Glas im Bauwesen - Thermisch vorgespanntes Borosilicat-Einscheibensicherheitsglas - Teil 1: Definition und Beschreibung

Verre dans la construction - Verre borosilicate de sécurité trempé thermiquement - Partie 1: Définition et description

Ta slovenski standard je istoveten z: **prEN 13024-1**

ICS:

81.040.20	Steklo v gradbeništvu	Glass in building

oSIST prEN 13024-1:2018 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 13024-1

March 2018

ICS 81.040.20

Will supersede EN 13024-1:2011

English Version

Glass in building - Thermally toughened borosilicate safety glass - Part 1: Definition and description

Verre dans la construction - Verre borosilicate de sécurité trempé thermiquement - Partie 1: Définition et description

Glas im Bauwesen - Thermisch vorgespanntes Borosilicat-Einscheiben-Sicherheitsglas - Teil 1: Definition und Beschreibung

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.

This draft European Standard was established by CEN 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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 United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword

This document (prEN 13024-1:2018) 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 will supersede EN 13024-1:2011.

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

In comparison with the previous edition, the following technical modifications have been made:

a) Clause 1 has been revised;

b) Clause 3 has been re-sorted (to agree with EN 12150-1:2015);

c) Clause 5 has been revised;

d) Clause 6.1, Table 1 with nominal thicknesses has been revised. Some thicknesses have been changed and some thicknesses have been deleted. Drawn sheet, rolled and cast glass is no longer included as they have been deleted from standard of the special basic glass prEN 1748-1-1:2017;

e) Clause 6.3.2 has been revised;

f) Title of Clause 6.3.3 has been revised;

g) Table 8 has been revised;

h) Clause “Bibliography” has been deleted.

EN 13024 is divided into the following parts:

— EN 13024-1, *Glass in building — Thermally toughened borosilicate safety glass — Part 1: Definition and description*;

— EN 13024-2, *Glass in building — Thermally toughened borosilicate safety glass — Part 2: Product standard*.

This document contains other aspects of importance for trade.

Introduction

Thermally toughened borosilicate safety glass has a higher thermal shock resistance and a safer breakage behaviour when compared with annealed glass. When it should be used to offer protection under accidental human impact, thermally toughened borosilicate safety glass should also be classified according to EN 12600.

1 Scope

This document specifies tolerances, flatness, edgework, fragmentation and physical and mechanical characteristics of monolithic flat thermally toughened borosilicate safety glass for use in buildings.

This standard deals exclusively with thermally toughened borosilicate safety glass manufactured by the horizontal toughening process.

Other requirements, not specified in this document, can apply to thermally toughened borosilicate safety glass which is incorporated into assemblies, e.g. laminated glass or insulating glass units, or undergo an additional treatment, e.g. coating. The additional requirements are specified in the appropriate product standard. Thermally toughened borosilicate safety glass, in this case, does not lose its mechanical or thermal characteristics and its resistance to temperature differentials.

Surface finished glasses (e.g. sandblasted, acid etched) after toughening are not covered by this document.

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

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 1748-1-1, *Glass in building — Special basic products — Borosilicate glasses — Part 1-1: Definition and general physical and mechanical properties*

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

3 Terms and definitions

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

3.1
thermally toughened borosilicate safety glass
glass within which a permanent surface compressive stress, additionally to the basic mechanical strength, has been induced by a controlled heating and cooling process in order to give it greatly increased resistance to mechanical and thermal stress and prescribed fragmentation characteristics

Note 1 to entry: The mechanical properties, i.e. thermal durability and mechanical strength, and safety properties, i.e. fragmentation characteristics, are generated by the level of surface compression. These properties are not size dependent.

3.2
flat thermally toughened borosilicate safety glass
thermally toughened borosilicate safety glass which has not been deliberately given a specific profile during manufacture

3.3
enamelled thermally toughened borosilicate safety glass
thermally toughened borosilicate safety glass which has a ceramic frit fired into the surface during the toughening process

Note 1 to entry: After toughening, the ceramic frit becomes an integral part of the glass.

Note 2 to entry: In the UK, this glass is also known as opaque thermally toughened borosilicate safety glass.

Note 3 to entry: The application of the ceramic frit may be by a continuous process or discontinuous application, e.g. screen printing. The enamelled surface could be partially or wholly covered.

3.4
horizontal process
process in which the glass is supported on horizontal rollers

3.5
edge lift
distortion produced in horizontal toughened glass, at the leading and trailing edge of the plate

3.6
overall bow
deformation of the whole pane of toughened glass caused by the heating and cooling process

3.7
roller wave distortion
distortion produced in horizontally toughened glass as a result of the glass during the toughening process being in contact with the rollers

4 Glass products

Thermally toughened borosilicate safety glass is made from a monolithic glass generally corresponding to one of the following standards:

— borosilicate float glass according to EN 1748-1-1;

— coated glass according to EN 1096-1.

Glass of nominal thicknesses other than those covered in the above standards is possible.

5 Fracture characteristics

The fracture characteristics of thermally toughened borosilicate safety glass are directly related to the amount of surface compression; these properties are not size dependent.

When the thermally toughened borosilicate safety glass is manufactured with the correct degree of surface compression then in the event of breakage thermally toughened borosilicate safety glass fractures into numerous small pieces, the edges of which are generally blunt.

NOTE 1 The degree of surface compression required is dependent upon glass type and thickness.

NOTE 2 The fracture characteristics of glass are unaffected by temperatures between –50 °C and +100 °C.

The fragmentation described in Clause 8 is undertaken on test specimens without any mechanical constraint.

The fragmentation in service may not always correspond to that determined during the fragmentation test due to the imposition of other stresses, i.e. from fixing or from reprocessing (e.g. laminating).

6 Dimensions and tolerances

6.1 Nominal thickness and thickness tolerances

The nominal thicknesses and thickness tolerances are those given in the relevant product standard (see Clause 4), some of which are reproduced in Table 1.

Table 1 — Nominal thicknesses and thickness tolerances

Dimensions in millimetres

Nominal thickness *d*	Thickness tolerances for float glass
3,3	±0,2
3,8	±0,2
5	±0,2
5,5	±0,2
6	±0,2
6,5	±0,2
7,5	±0,3
8	±0,3
9	±0,3
10	±0,3
12	±0,3
15	±0,5

The thickness of a pane shall be determined as for the basic product. The measurement shall be taken at the centres of the four sides.

6.2 Width and length (sizes)

6.2.1 General

When thermally toughened borosilicate safety glass dimensions are quoted for rectangular panes, the first dimension shall be the width, *B*, and the second dimension the length, *H*, as shown in Figure 1. It shall be made clear which dimension is the width, *B*, and which is the length, *H*, when related to its installed position.

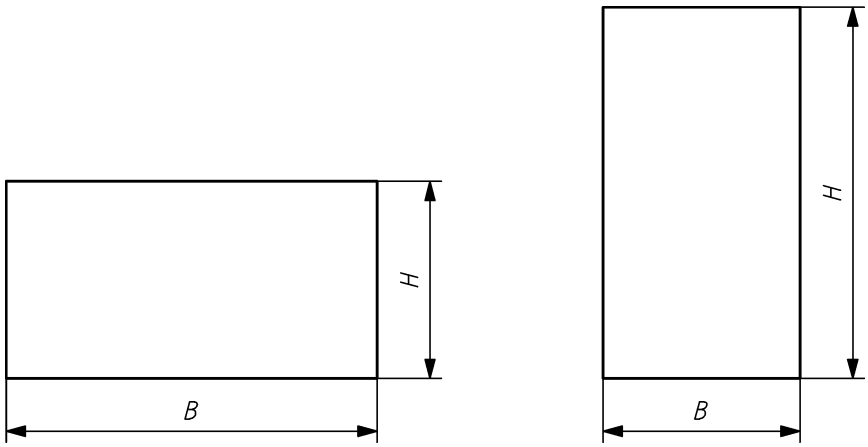

Figure 1 — Examples of width, *B*, and length, *H*, relative to the pane shape

6.2.2 Maximum and minimum sizes

For maximum and minimum sizes, the manufacturer should be consulted.

6.2.3 Tolerances and squareness

The nominal dimensions for width and length being given, the finished pane shall not be larger than the nominal dimensions increased by the tolerance *t*, or smaller than the nominal dimensions reduced by the tolerance *t*. Limits are given in Table 2.

The squareness of rectangular glass panes is expressed by the difference between its diagonals.

The difference between the two diagonal lengths of the pane of glass shall not be larger than the deviation limit, *v*, as specified in Table 3.

Table 2 — Tolerances on width, *B*, and length, *H*

Dimensions in millimetres

Nominal dimension of side, *B* or *H*	Tolerance, t	
	nominal glass thickness, *d* ≤ 8	nominal glass thickness, *d* > 8
≤ 2 000	±3,0	±4,0
2 000 < *B* or *H* ≤ 3 000	±4,0	±5,0
> 3 000	±5,0	±6,0

Table 3 — Limit deviations for the difference between diagonals

Dimensions in millimetres

Limit deviation v on the difference between diagonals		
Nominal dimension *B* or *H*	nominal glass thickness, *d* ≤ 8	nominal glass thickness, *d* > 8
≤ 2 000	≤ 4	≤ 6
2 000 < *B* or *H* ≤ 3 000	≤ 6	≤ 8
> 3 000	≤ 8	≤ 10

6.3 Flatness

6.3.1 General

By the very nature of the toughening process, it is not possible to obtain a product as flat as annealed glass. This difference in flatness depends on the type of glass, e.g. coated, etc., glass dimensions, i.e. the nominal thickness, the dimensions and the ratio between the dimensions.

There are three kinds of distortion:

— overall bow (see Figure 2);

— roller wave distortion (see Figure 3);

— edge lift (see Figure 4).

NOTE Overall bow, roller wave distortion and edge lift can, in general, be accommodated by the framing system.