

# Glass in building — Thermally toughened soda lime silicate safety glass —

## Part 1: Definition and description

The European Standard EN 12150-1:2000 has the status of a  
British Standard

ICS 81.040.20

# National foreword

This British Standard is the official English language version of EN 12150-1:2000.  
The UK participation in its preparation was entrusted by Technical Committee B/520, Glass and glazing in building, to Subcommittee B/520/1, Basic and transformed glass products, which has the responsibility to:

- aid enquirers to understand the text;
- present to the responsible European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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## Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 24, an inside back cover and a back cover.

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English version

## Glass in building - Thermally toughened soda lime silicate safety glass - Part 1: Definition and description

Verre dans la construction - Verre de silicate sodo-calciq  
de sécurité trempé thermiquement - Partie 1: Définition et  
description

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

This European Standard was approved by CEN on 16 April 1999.

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. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

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, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.



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COMITÉ EUROPÉEN DE NORMALISATION  
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## Foreword

This European Standard 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 December 2000, and conflicting national standards shall be withdrawn at the latest by December 2000.

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

## Introduction

Thermally toughened soda lime silicate safety glass has a safer breakage behaviour when compared with annealed glass. When it should be used to offer protection under accidental human impact, thermally toughened soda lime silicate safety glass also should be classified according to prEN 12600.

NOTE: CEN/TC129/WG8 is producing standards for the determination of the design strength of glass and is preparing a design method.

NOTE: CEN/TC129/WG2 is preparing a standard for production control and evaluation of conformity.

## 1 Scope

This European Standard specifies tolerances, flatness, edgework, fragmentation and physical and mechanical characteristics of monolithic flat thermally toughened soda lime silicate safety glass for use in buildings.

Information on curved thermally toughened soda lime silicate safety glass is given in annex B, but this product does not form part of this standard.

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

## 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to be revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

|            |                                                                                                                                   |
|------------|-----------------------------------------------------------------------------------------------------------------------------------|
| EN 572-1   | Glass in building - Basic soda lime silicate glass products - Part 1: Definitions and general physical and mechanical properties. |
| EN 572-2   | Glass in building - Basic soda lime silicate glass products - Part 2: Float glass.                                                |
| EN 572-4   | Glass in building - Basic soda lime silicate glass products - Part 4: Drawn sheet glass.                                          |
| EN 572-5   | Glass in building - Basic soda lime silicate glass products - Part 5: Patterned glass.                                            |
| EN 673     | Glass in building - Determination of thermal transmittance (U value) - Calculation method.                                        |
| EN 1096-1  | Glass in building - Coated glass - Part 1: Definitions and classification.                                                        |
| prEN 12600 | Glass in building - Pendulum test - Impact test method for flat glass and performance requirements.                               |

### 3 Definitions

For the purposes of this European Standard the following definitions apply.

**3.1 thermally toughened soda lime silicate safety glass:** glass within which a permanent surface compressive stress 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

**3.2 flat thermally toughened soda lime silicate safety glass:** thermally toughened soda lime silicate safety glass which has not been deliberately given a specific profile during manufacture

**3.3 enamelled thermally toughened soda lime silicate safety glass:** thermally toughened soda lime silicate safety glass which has a ceramic frit fired into the surface during the toughening process. After toughening, the ceramic frit becomes an integral part of the glass

NOTE: In the UK, this glass is also known as opaque thermally toughened soda lime silicate safety glass.

**3.4 horizontal toughening:** process in which the glass is supported on horizontal rollers

**3.5 vertical toughening:** process in which the glass is suspended by tongs

### 4 Glass products

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

- soda lime silicate glass according to EN 572-1;
- float glass according to EN 572-2;
- drawn sheet glass according to EN 572-4;
- patterned glass according to EN 572-5;
- coated glass according to EN 1096-1.

Other nominal thicknesses of glass than those covered in the above standards are possible.

### 5 Fracture characteristics

In the event of breakage, thermally toughened soda lime silicate safety glass fractures into numerous small pieces, the edges of which are generally blunt.

NOTE: Fragmentation in service does not always correspond to that described in clause 8, due to restraint from fixing or reprocessing (e.g. laminating), or due to the cause of fracture.

### 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<br>thickness $d$ | Thickness tolerances for glass type |                  |           |
|--------------------------|-------------------------------------|------------------|-----------|
|                          | Drawn sheet                         | Patterned        | Float     |
| 3                        | $\pm 0,2$                           | $\pm 0,5$        | $\pm 0,2$ |
| 4                        | $\pm 0,2$                           | $\pm 0,5$        | $\pm 0,2$ |
| 5                        | $\pm 0,3$                           | $\pm 0,5$        | $\pm 0,2$ |
| 6                        | $\pm 0,3$                           | $\pm 0,5$        | $\pm 0,2$ |
| 8                        | $\pm 0,4$                           | $\pm 0,8$        | $\pm 0,3$ |
| 10                       | $\pm 0,5$                           | $\pm 1,0$        | $\pm 0,3$ |
| 12                       | $\pm 0,6$                           | not manufactured | $\pm 0,3$ |
| 15                       | not manufactured                    | not manufactured | $\pm 0,5$ |
| 19                       | not manufactured                    | not manufactured | $\pm 1,0$ |
| 25                       | not manufactured                    | not manufactured | $\pm 1,0$ |

The thickness of a pane shall be determined as for the basic product. The measurement shall be taken at the centres of the 4 sides, and away from the area of any tong marks (see Figure 3), which may be present.

**6.2 Width and length (sizes)**

**6.2.1 General**

When thermally toughened soda lime silicate 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.

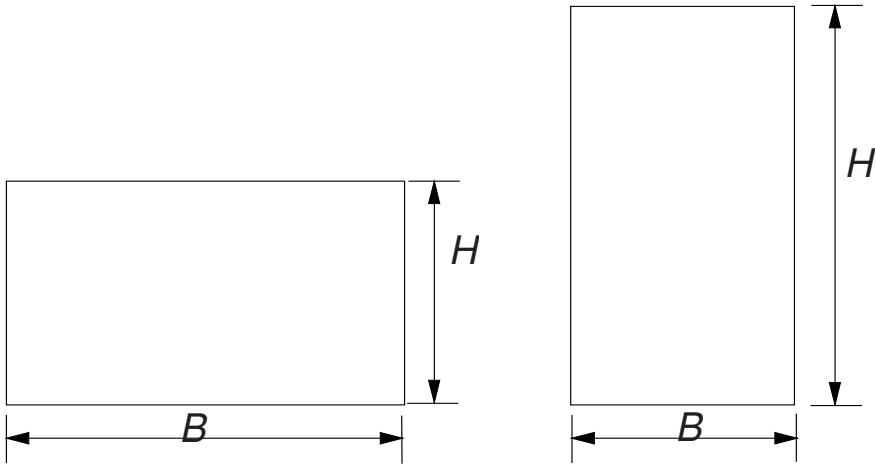


**Figure 1: Examples of width,  $B$ , and length,  $H$ , relative to the pane shape**

NOTE: For thermally toughened soda lime silicate safety glass manufactured from patterned glass, the direction of the pattern should be specified relative to one of the dimensions.

### 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 a prescribed rectangle resulting from the nominal dimensions increased by the tolerance,  $t$ , or smaller than a prescribed rectangle reduced by the tolerance,  $t$ . The sides of the prescribed rectangles are parallel to one another and these rectangles shall have a common centre (see Figure 2). The limits of squareness are also the prescribed rectangles. Tolerances are given in Table 2.

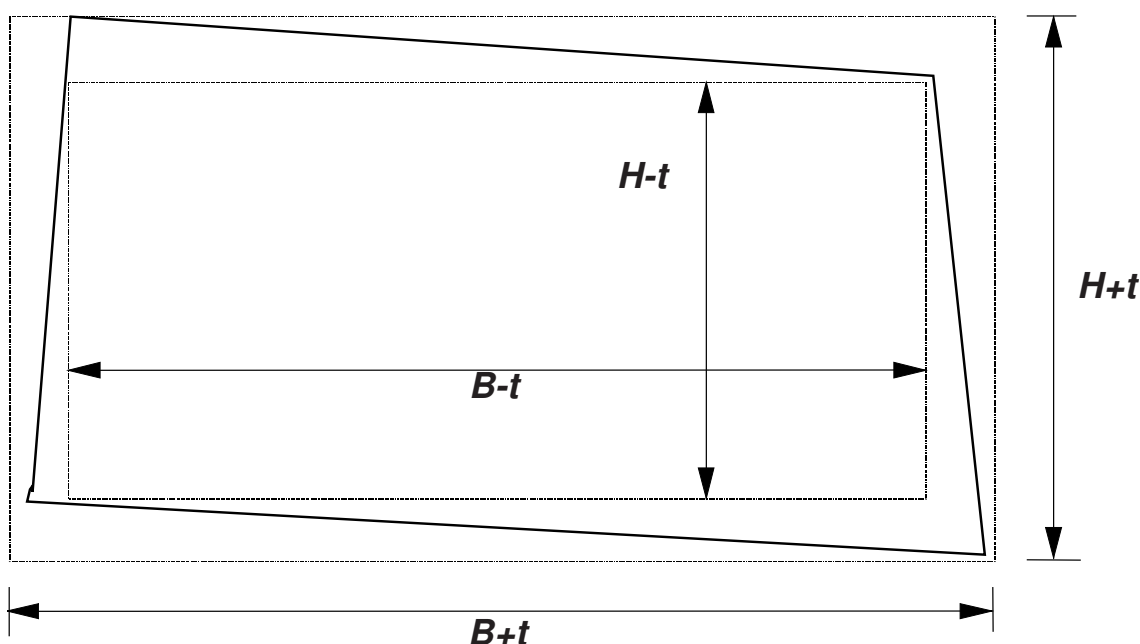


Figure 2: Tolerance limits for dimensions of rectangular panes

Table 2: Tolerances on width,  $B$ , and length,  $H$

Dimensions in millimetres

| Nominal dimension<br>of side, $B$ or $H$ | Tolerance, $t$                                                       |                                      |
|------------------------------------------|----------------------------------------------------------------------|--------------------------------------|
|                                          | nominal glass thickness,<br>$d \leq 12$                              | nominal glass thickness,<br>$d > 12$ |
| $\leq 2\,000$                            | $\pm 2,5$ (horizontal toughening)<br>$\pm 3,0$ (vertical toughening) | $\pm 3,0$                            |
| $2\,000 < B$ or $H \leq 3\,000$          | $\pm 3,0$                                                            | $\pm 4,0$                            |
| $> 3\,000$                               | $\pm 4,0$                                                            | $\pm 5,0$                            |