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# Glass in building — Tempered soda lime silicate safety glass

*Verre dans la construction — Verre silico-sodo-calcique de sécurité trempé*

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# Contents

Page

**Foreword** ..... **v**
**Introduction** ..... **vi**
**1 Scope** ..... **1**
**2 Normative references** ..... **1**
**3 Terms and definitions** ..... **1**
**4 Glass products** ..... **3**
**5 Fracture characteristics** ..... **3**
5.1 General ..... 3
5.2 Accidental human impact ..... 3
5.3 Fragmentation ..... 3
**6 Dimensions and tolerances** ..... **4**
6.1 Nominal thickness and thickness tolerances ..... 4
6.2 Width and length (sizes) ..... 4
6.2.1 General ..... 4
6.2.2 Maximum and minimum sizes ..... 5
6.2.3 Tolerances and squareness ..... 5
6.2.4 Edge deformation produced by vertical tempering ..... 5
6.3 Flatness ..... 6
6.3.1 General ..... 6
6.3.2 Measurement of overall bow ..... 8
6.3.3 Measurement of wave or roller wave distortion ..... 9
6.3.4 Measurement of edge lift (for horizontally tempered safety glass only) ..... 10
6.3.5 Measurement of perimeter deformation of glass produced by air cushion toughening process ..... 11
6.3.6 Measurement of local distortion (for vertically tempered safety glass only) ..... 12
6.3.7 Limitation on overall bow, roller waves and edge lift for horizontally tempered safety glass ..... 12
6.3.8 Limitation on overall bow, wave and perimeter deformation for tempered safety glass manufactured by air cushion process ..... 13
6.3.9 Limitation on overall bow and local distortion for vertically tempered safety glass ..... 13
6.3.10 Other distortions ..... 14
**7 Edge work, holes, notches and cut-outs** ..... **14**
7.1 General ..... 14
7.2 Edge working of glass for tempering ..... 14
7.3 Profiled edges ..... 15
7.4 Round holes ..... 15
7.4.1 General ..... 15
7.4.2 Diameter of holes ..... 15
7.4.3 Limitations on position of holes ..... 15
7.4.4 Tolerances on hole diameters ..... 17
7.4.5 Tolerances on position of holes ..... 17
7.5 Holes/others ..... 18
7.6 Notches and cut-outs ..... 18
7.7 Shaped panes ..... 19
**8 Fragmentation test** ..... **19**
8.1 General ..... 19
8.2 Dimensions and number of test specimens ..... 19
8.3 Test procedure ..... 19
8.4 Assessment of fragmentation ..... 20
8.5 Minimum values from the particle count ..... 21

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8.6 Selection of the longest particle ..... 22
8.7 Maximum length of the longest particle ..... 22
8.8 Test report ..... 22
**9 Other physical characteristics ..... 22**
9.1 Optical distortion ..... 22
9.1.1 Tempered safety glass produced by vertical tempering ..... 22
9.1.2 Tempered safety glass produced by horizontal tempering ..... 22
9.2 Anisotropy (iridescence) ..... 22
9.3 Thermal durability ..... 23
9.4 Mechanical strength ..... 23
9.5 Surface pre-stress ..... 23
**10 Marking ..... 24**
**11 Packaging ..... 24**
**Annex A** (normative) **Pendulum impact test methods ..... 25**
**Annex B** (informative) **Alternative method for the measurement of roller wave distortion ..... 26**
**Annex C** (informative) **Example of particle count ..... 28**
**Annex D** (informative) **Method for the measurement of the surface pre-stress of tempered safety glass ..... 31**
**Bibliography ..... 33**

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# Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by ISO/ TC 160, *Glass in building*, Subcommittee SC 1, *Product considerations*.

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# Introduction

Tempered soda lime silicate safety glass has a breakage behaviour that is different to annealed glass. This behaviour is a direct result of the high surface pre-stress.

Tempered soda lime silicate safety glass has a known behaviour under accident human impact together with known mechanical and thermal stress resistance.

NOTE 1 ISO/TC 160/SC 2 produces standards for the determination of the design strength of glass and is preparing a design method.

NOTE 2 In Europe, the term “thermally toughened” is used instead of “tempered”.


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# Glass in building — Tempered soda lime silicate safety glass

## 1 Scope

This document covers product definitions, product characteristics, i.e. tolerances, flatness, edgework, etc., fracture characteristics, including fragmentation, and the physical and mechanical characteristics of flat tempered soda lime silicate safety glass for use in buildings.

This document does not cover curved (bent) glass according to ISO 11485.

Other requirements, not specified in this document, can apply to thermally toughened soda lime silicate 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 glass product standard. Thermally toughened soda lime silicate safety glass, in this case, does not lose its mechanical or thermal characteristics.

## 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.

ISO 1288-3, *Glass in building — Determination of the bending strength of glass — Part 3: Test with specimen supported at two points (four point bending)*

ISO 11479-1, *Glass in building — Coated glass — Part 1: Physical defects*

ISO 16293-1, *Glass in building — Basic soda lime silicate glass products — Part 1: Definitions and general physical and mechanical properties*

ISO 16293-2:—[1)], *Glass in building — Basic soda lime silicate glass products — Part 2: Float glass*

ISO 16293-5:—[1)], *Glass in building — Basic soda lime silicate glass products — Part 5: Patterned glass*

ISO 29584, *Glass in building — Pendulum impact testing and classification of safety 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**
**flat tempered safety glass**
tempered (thermally toughened) glass which has not been deliberately given a specific profile during manufacture

1) Under preparation.

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**3.2**
**enamelled tempered safety glass**
tempered (thermally toughened) glass which has a ceramic frit fired into the surface during the tempering (toughening) process

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

Note 2 to entry: The application of the ceramic frit may be by a continuous application or discontinuous, e.g. screen printing.

**3.3**
**horizontal process**
process in which the glass is supported on horizontal rollers

**3.4**
**air cushion process**
process in which the glass is supported by an air cushion with or without additional rollers

Note 1 to entry: In this process, the glass will be between horizontal and 45° of horizontal.

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

**3.6**
**edge deformation**
deformation of the edge caused by the tong marks

**3.7**
**edge lift**
distortion produced in horizontally tempered safety glass, at the leading and trailing edge of the plate, as a result of the glass during the tempering (toughening) process not being supported by a roller

Note 1 to entry: This is a distortion produced by a deviation from surface flatness.

Note 2 to entry: Also referred to as edge dip.

**3.8**
**perimeter deformation**
distortion around the edge of tempered safety glass manufactured by air cushion process

**3.9**
**local distortion**
local deformation of vertically tempered safety glass underneath the tong marks

**3.10**
**overall bow**
deformation of the whole pane of tempered safety glass caused by the heating and cooling process

**3.11**
**roller wave distortion**
periodic distortion produced in horizontally tempered safety glass as a result of the glass during tempering process being in contact with the rollers

Note 1 to entry: This is a surface distortion produced by a reduction in surface flatness.

**3.12**
**wave distortion**
distortion in tempered safety glass manufactured by the air cushion process as a result of the tempering process


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