

EHITUSKLAAS. KLAASITAHVLITE KANDEVÕIME  
MÄÄRAMINE ARVUTUSE TEEL

Glass in building - Determination of the lateral load  
resistance of glass panes by calculation

## EESTI STANDARDI EESSÕNA

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English Version

## Glass in building - Determination of the lateral load resistance of glass panes by calculation

Verre dans la construction - Détermination de la résistance des feuilles de verre par calcul et par essai

Glas im Bauwesen - Bestimmung des Belastungswiderstandes von Glasscheiben durch Berechnung und Prüfung

This European Standard was approved by CEN on 21 July 2019.

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# Contents

Page

<b>European foreword</b> .....	<b>3</b>
<b>Introduction</b> .....	<b>4</b>
<b>1 Scope</b> .....	<b>5</b>
<b>2 Normative references</b> .....	<b>5</b>
<b>3 Terms and definitions</b> .....	<b>7</b>
<b>4 Symbols and abbreviations</b> .....	<b>8</b>
<b>5 Requirements</b> .....	<b>13</b>
5.1 Basis of determination of load resistance of glass .....	13
5.2 Material partial factor .....	14
5.3 Process of determining the load resistance of glass.....	14
<b>6 Mechanical and physical properties of glass</b> .....	<b>14</b>
6.1 Values .....	14
6.2 Approximate values .....	15
<b>7 Actions</b> .....	<b>15</b>
7.1 Assumptions related to the actions and combinations of actions .....	15
7.2 Combinations of actions .....	15
<b>8 Strength and stress</b> .....	<b>16</b>
8.1 Design value of bending strength for annealed glass.....	16
8.2 Design value of bending strength for prestressed glass .....	18
<b>9 Calculation principles and conditions</b> .....	<b>19</b>
9.1 General method of calculation .....	19
9.2 Calculation method for laminated glass and laminated safety glass.....	22
9.3 Calculation method for insulating glass units .....	22
<b>Annex A (informative) Parameters</b> .....	<b>23</b>
<b>Annex B (informative) Calculation formulae for stress and deflection for large deflections of rectangular panes supported on all edges</b> .....	<b>32</b>
<b>Annex C (informative) Calculation process for insulating glass units</b> .....	<b>36</b>
<b>Annex D (informative) Simplified calculation method for laminated glass</b> .....	<b>48</b>
<b>Bibliography</b> .....	<b>52</b>

## European foreword

This document (EN 16612:2019) has been prepared by Technical Committee CEN/TC 129 “Glass in Building”, the secretariat of which is held by NBN.

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 2020 and conflicting national standards shall be withdrawn at the latest by April 2020.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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## Introduction

This document gives a method of determining the lateral load resistance of linearly supported glass elements.

The method of determining the load resistance of glass is in accordance with the principles of structural Eurocode EN 1990: Basis of structural design. The actions are determined in accordance with the structural Eurocode 1 series for actions on structures, e.g. EN 1991-1-1, EN 1991-1-3 and EN 1991-1-4, including the National annexes. In the design processes, the reliability is part of national competency. For that reason, this document foresees that, to conform with the rules applied by the Eurocodes, the following parameters are subject to national determination:

- material partial factors,  $\gamma_{M,A}$  and  $\gamma_{M,V}$  ;
- factors for the load duration,  $k_{\text{mod}}$  ;
- factor for stressed edges,  $k_e$ .

## 1 Scope

This document gives a method of determining the design value of the bending strength of glass. It gives the general method of calculation, and guidance for lateral load resistance of linearly supported glazed elements used as infill panels.

NOTE Examples of lateral loads are wind loads, snow loads, self weight of sloping glass, and cavity pressure variations on insulating glass units.

This document gives recommended values for the following factors for glass as a material:

- material partial factors,  $\gamma_{M;A}$  and  $\gamma_{M;V}$  ;
- factors for the load duration,  $k_{\text{mod}}$  ;
- factor for stressed edges,  $k_e$ .

Most glass in buildings is used as infill panels. This document covers those infill panels that are in a class of consequence lower than those covered in EN 1990, so proposed values for the partial load factors,  $\gamma_Q$  and  $\gamma_G$ , are given for these infill panels.

The action of cavity pressure variations on insulating glass units is not covered by Eurocodes, so this document also gives proposed values of combination factors,  $\psi_0$ ,  $\psi_1$  and  $\psi_2$ , for this action.

This document does not determine suitability for purpose. Resistance to lateral loads is only one part of the design process, which could also need to take into account:

- in-plane loading, buckling, lateral torsional buckling, and shear forces,
- environmental factors (e.g. sound insulation, thermal properties),
- safety characteristics (e.g. fire performance, mode of breakage in relation to human safety, security).

This document does not apply to channel shaped glass, glass blocks and pavers, or vacuum insulated glass units.

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

EN 572-1, *Glass in building — Basic soda-lime silicate glass products — Part 1: Definitions and general physical and mechanical properties*

EN 673, *Glass in building — Determination of thermal transmittance (U value) — Calculation method*

EN 1279-5, *Glass in building — Insulating glass units — Part 5: Product standard*

EN 1288-2, *Glass in building — Determination of bending strength of glass — Part 2: Coaxial double ring test on flat specimens with large test surface areas*

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 1748-2-1, *Glass in building — Special basic products — Glass ceramics — Part 2-1: Definitions and general physical and mechanical properties*

EN 1863-1, *Glass in building — Heat strengthened soda lime silicate glass — Part 1: Definition and description*

EN 1990:2002<sup>1</sup>, *Eurocode — Basis of structural design*

EN 1991-1-1, *Eurocode 1: Actions on structures — Part 1-1: General actions — Densities, self-weight, imposed loads for buildings*

EN 1991-1-3, *Eurocode 1: Actions on structures — Part 1-3: General actions - Snow loads*

EN 1991-1-4, *Eurocode 1: Actions on structures — Part 1-4: General actions - Wind actions*

EN 12150-1, *Glass in building — Thermally toughened soda lime silicate safety glass — Part 1: Definition and description*

EN 12337-1, *Glass in building — Chemically strengthened soda lime silicate glass — Part 1: Definition and description*

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

EN 14178-1, *Glass in building — Basic alkaline earth silicate glass products — Part 1: Float glass*

EN 14179-1, *Glass in building — Heat soaked thermally toughened soda lime silicate safety glass — Part 1: Definition and description*

EN 14321-1, *Glass in building — Thermally toughened alkaline earth silicate safety glass — Part 1: Definition and description*

EN 14449, *Glass in building — Laminated glass and laminated safety glass — Evaluation of conformity/Product Standard*

EN 15681-1, *Glass in building — Basic alumino silicate glass products — Part 1: Definitions and general physical and mechanical properties*

EN 15682-1, *Glass in building — Heat soaked thermally toughened alkaline earth silicate safety glass — Part 1: Definition and description*

EN 16613, *Glass in building — Laminated glass and laminated safety glass — Determination of interlayer mechanical properties*

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<sup>1</sup> This document is impacted by the amendment EN 1990:2002/A1:2005 and the corrigendum EN 1990:2002/A1:2005/AC:2010.