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Glass in building — Determination of the bending strength of glass —

Part 1: Fundamentals of testing glass

Verre dans la construction — Détermination de la résistance du verre à la flexion —

Partie 1: Principes fondamentaux des essais sur le verre

Reference number
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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 meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 160, *Glass in building*, Subcommittee SC 2, *Use considerations.*

ISO 1288 consists of the following parts, under the general title *Glass in building — Determination of the bending strength of glass*:

— *Part 1: Fundamentals of testing glass*

— *Part 2: Coaxial double ring test on flat specimens with large test surface areas*

— *Part 3: Test with specimen supported at two points (four point bending)*

— *Part 4: Testing of channel shaped glass*

— *Part 5: Coaxial double ring test on flat specimens with small test surface areas*

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Glass in building — Determination of the bending strength of glass —

Part 1: Fundamentals of testing glass

1 Scope

This part of ISO 1288 specifies the determination of the bending strength of monolithic glass for use in buildings. The testing of insulating units or laminated glass is excluded from this part of ISO 1288.

This part of ISO 1288 describes

— considerations to be taken into account when testing glass,

— explanations of the reasons for designing different test methods,

— limitations of the test methods, and

— gives pointers to safety requirements for the personnel operating the test equipment.

ISO 1288-2, ISO 1288-3, ISO 1288-4 and ISO 1288-5 specify test methods in detail.

The test methods specified in this part of ISO 1288 are intended to provide large numbers of bending strength values that can be used as the basis for statistical evaluation of glass strength.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

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

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 1288-4, *Glass in building — Determination of the bending strength of glass — Part 4: Testing of channel shaped glass*

ISO 1288-5, *Glass in building — Determination of the bending strength of glass — Part 5: Coaxial double ring test on flat specimens with small test surface areas*

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

NOTE ISO TC 160/SC 1 is commencing work on standards for “thermally tempered soda lime silicate safety glass”, “heat strengthened soda lime silicate glass” and “chemically strengthened glass.”

3 Terms and definitions

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

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3.1
flat glass
any glass product conforming to ISO 16293-2, ISO 16293-3, ISO 16293-4 and ISO 16293-5, or any transformed glass made from these products without deliberately inducing profile or curvature

3.2
bending stress
tensile bending stress induced in the surface of a specimen

Note 1 to entry: For testing purposes, the bending stress should be uniform over a specified part of the surface.

3.3
effective bending stress
weighted average of the tensile bending stresses, calculated by applying a factor to take into account non-uniformity of the stress field

3.4
bending strength
bending stress (3.2) or *effective bending stress* (3.3) which leads to breakage of the specimen

3.5
equivalent bending strength
apparent *bending strength* (3.4) of patterned glass, for which the irregularities in the thickness do not allow precise calculation of the *bending stress* (3.2)

3.6
profile bending strength
quotient of the maximum bending moment and the section modulus of a channel shaped glass

3.7
stress intensity factor
measure of the stress at a crack tip

3.8
prestressed glass
any glass product that has a surface prestress, i.e. thermally tempered soda lime silicate safety glass, heat strengthened soda lime silicate glass and chemically strengthened glass

4 Symbols

F	applied load	N
h	specimen thickness	M
L	length of side of square test sample	M
k	constant for calculation of bending stress in ISO 1288-3	M
K_1, K_2	constants for calculation of bending stress in ISO 1288-5	
M_{bB}	maximum bending moment	Nm
p	gas pressure applied within loading ring in ISO 1288-2	Pa
P_{bB}	profile bending strength (of channel shaped glass) = M_{bB}/Z	Pa
r_1	radius of loading ring	M
r_2	radius of supporting ring	M

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