SLOVENSKI STANDARD
SIST EN 17635:2023

01-februar-2023

Steklo v gradbeništvu - Lastnosti loma - Zahteve in metode ocenjevanja

Glass in buildig - Shatter properties - Requirements and assessment methods

Glas in Bauwesen - Brucheigenschaften - Anforderungen und Bewertungsmethoden

Verre dans la construction - Comportement lors du bris - Exigences et méthodes d'évaluation

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ICS:

81.040.20	Steklo v gradbeništvu	Glass in building

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Glass in building - Shatter properties - Requirements and assessment methods

Verre dans la construction - Comportement lors du bris - Exigences et méthodes d'évaluation

Glas im Bauwesen - Brucheigenschaften - Anforderungen und Bewertungsmethoden

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European foreword

This document (EN 17635:2022) 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of an identical text or by endorsement, at the latest by May 2023, and conflicting national standards shall be withdrawn at the latest by May 2023.

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

Under the former Construction Products Directive, the concept of “conformity with the standard” has make the assessment of fragmentation properties mandatory for thermally treated glass, as failing to satisfy the fragmentation test (pass/fail criterion) forbid the manufacturer to claim compliance with the relevant standard.

With the Construction Products Regulation, the concept of “conformity with the standard” doesn't exist anymore. Therefore, in order to fulfil the needs of national regulations which presuppose that this assessment is made, fragmentation properties have to be declared explicitly in the declaration of performances (DoP).

The description of the fragmentation test was in the part 1 of six product standards, five of them using the Method A and one using the method B (see bibliography, references [3] to [8]). But no reference was made to this test in the harmonized part (part 2) of the same product standard. Moreover, glass presenting specific shatter properties can be used as substrate or as component of further transformed glass products, for which the possibility to declare the shatter property was not explicitly mentioned in the respective hEN.

The aim by transferring the description of the fragmentation tests in a separate standard on shatter properties is to allow for a declaration of this characteristic in the DoP. All hENs on glass products, when revised, will make a reference to the shatter properties standard in their Clause 4, “Characteristics”. Shatter properties will be a characteristic that will be possible to declare, like any other characteristic already included in Clause 4.

The wording “shatter properties” is the one used in Mandate M/135. In order to be compliant with that Mandate, the word “fragmentation” is replaced by “shatter properties” although nothing has been modified in the description of the test methods.

1 Scope

This document gives test methods to assess the shatter properties of different types of monolithic flat glass for use in building and construction works, for which a specific fragmentation pattern is required when tested under defined conditions.

NOTE Thermally treated monolithic glass is a product for which such a requirement exists.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

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

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
shatter properties
property of a glass pane to fragment in accordance with a specified pattern when tested under defined conditions

3.2
fragment
any portion of a glass pane obtained after its fracture and having the same thickness as the original pane

Note 1 to entry: Glazing dust, slivers and all other smaller particles are not accounted as fragments.

3.3
particle
fragments with an area less than 100 mm^2

3.4
island
fragments with an area greater than or equal to 100 mm^2

4 General

The shatter properties of a glass can be assessed by verifying its fracture characteristics under defined conditions. This makes it possible to verify that the shatter properties are those expected for the kind of glass product, especially when a thermal treatment has been performed.

Two assessment methods are described in this document:

— Method A is used for glass expected to fracture into numerous small pieces, the edges of which are generally blunt, see Clause 5;

— Method B is used for glass expected to fracture in a manner similar to annealed glass, with defined limitations on islands and particles, see Clause 6.

The shatter properties assessment described in Clauses 5 and 6 is undertaken on unrestrained test specimens.

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

5 Method A

5.1 Dimensions and number of test specimens

The dimensions of the test specimens shall be 360 mm × 1 100 mm, without holes, notches or cut-outs.

Five specimens shall be tested.

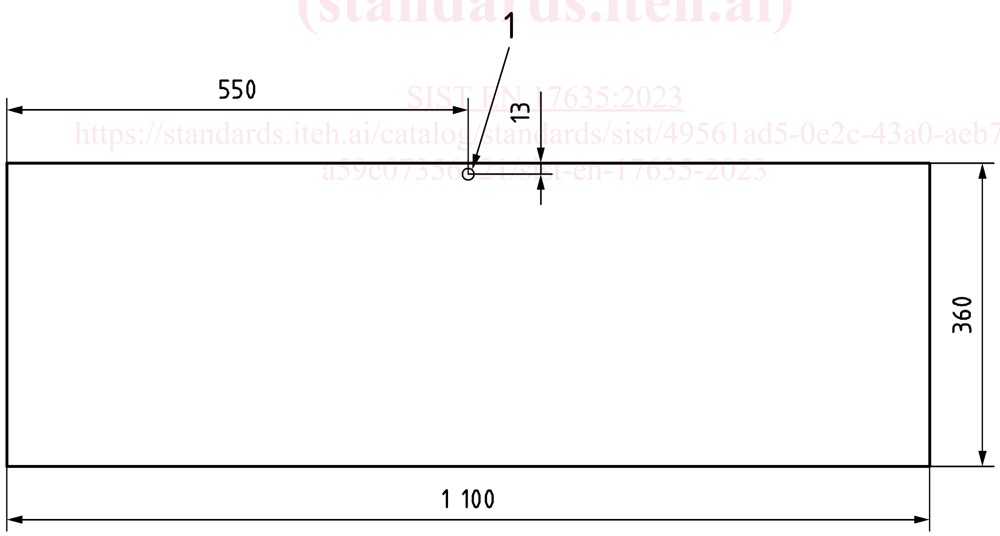
5.2 Test procedure

Each test specimen shall be impacted, using a pointed steel tool, at a position 13 mm in from the longest edge of the test specimen at the mid-point of that edge, until breakage occurs (see Figure 1).

Examples of steel tools are a hammer of about 75 g mass, a spring loaded centre punch, or other similar appliance with a hardened point. The radius of curvature of the point should be approximately 0,2 mm.

The test specimen shall be laid flat on a table without any mechanical constraint. In order to prevent scattering of the fragments, the specimen shall be simply held at the edges, e.g. by a small frame, adhesive tape etc., so that the fragments remain interlocked after breakage yet extension of the specimen is not hindered.

Dimensions in millimetres



Key

1 impact point

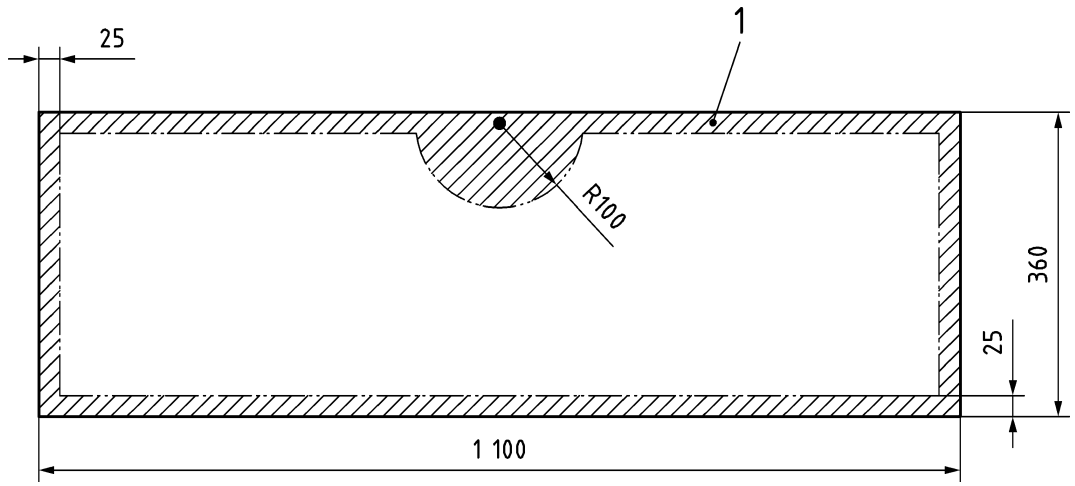
Figure 1 — Position of impact point - Method A

When tong marks are present at one edge (in case of vertically thermally treated glass), the impact point shall not be on the tong mark edge.

5.3 Assessment of the shatter properties

The particle count and measuring of the dimensions of the largest particle shall be made between 3 min to 5 min after fracture. An area of radius 100 mm, centred on the impact point, and a border of 25 mm, round the edge of the test specimen (see Figure 2), shall be excluded from the assessment.

Dimensions in millimetres



Key

1 excluded area

Figure 2 —Area to be excluded from the particle count determination and largest particle measurement – Method A

The particle count shall be made in the region of coarsest fracture (the aim being to obtain the minimum value). The particle count shall be made by placing a mask of (50 ± 1) mm × (50 ± 1) mm on the test piece (see Annex A). The number of crack-free particles within the mask shall be counted. A particle is 'crack-free' if it does not contain any cracks which run from one edge to another (see Figure 3).

The examination should be completed within 5 min of fracturing the glass.

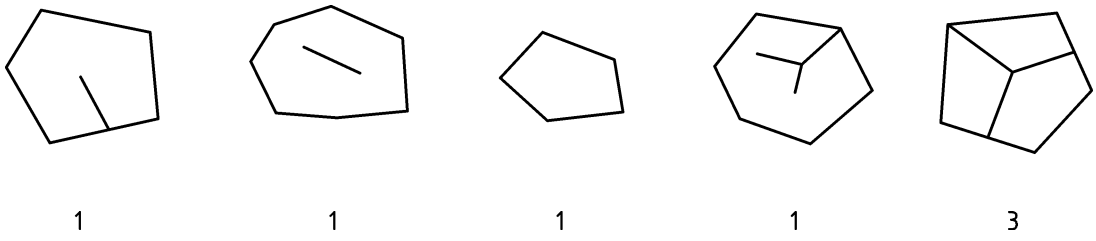


Figure 3 — Examples of 'crack-free' particles and the assessment regarding the number – Method A

In the particle count, all particles wholly contained within the area of the mask shall be counted as one particle each and all the particles which are partially within the mask shall be counted as 1/2 particle each (see Annex A).

5.4 Minimum values from the particle count

The particle count of each test specimen shall not be less than the values given in Table 1.

Table 1 — Minimum particle count values for all glass type – Method A

Nominal thickness, *d* mm	**Minimum particle count (number)**	
	All applications except shower enclosure	**Shower enclosure (see [1])**
2	15	Not applicable
3 to 3,8	15	40
4 to 12	40	40
15 to 25	30	30

5.5 Maximum length of longest particle

The longest particle shall be chosen from the body of the test specimen. It shall not be in the excluded area (see Figure 2).

The length of the longest particle of each test specimen shall not exceed 100 mm.

6 Method B

6.1 Dimensions and number of test specimens

The dimensions of the test specimens shall be 360 mm × 1100 mm, without holes, notches or cut-outs.

Five specimens shall be tested.

6.2 Test procedure

Each test specimen shall be impacted, using a pointed steel tool, at a position 20 mm in from the longest edge of the test specimen at the mid-point of that edge, until breakage occurs (see Figure 4).

Examples of steel tools are a hammer of about 75 g mass, a spring loaded centre punch, or other similar appliance with a hardened point. The radius of curvature of the point should be approximately 0,2 mm.

The test specimen shall be laid flat on a table without any mechanical constraint. In order to prevent scattering of the fragments, the specimen shall be simply held at the edges, e.g. by a small frame, adhesive tape etc., so that the fragments remain interlocked after breakage yet extension of the specimen is not hindered.