

SVENSK STANDARD

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Glasfasader – Slaghållfasthet – Prestandakrav

Curtain Walling – Impact resistance – Performance requirements

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Denna standard ersätter SS-EN 14019:2004, utgåva 1.

The European Standard EN 14019:2016 has the status of a Swedish Standard. This document contains the official English version of EN 14019:2016.

This standard supersedes the Swedish Standard SS-EN 14019:2004, edition 1.

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Denna standard är framtagen av kommittén för Fönster, dörrar, portar, glasfasader, beslag och byggglas, SIS/TK 179.

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EUROPEAN STANDARD

EN 14019

NORME EUROPÉENNE

EUROPÄISCHE NORM

June 2016

ICS 91.060.10

Supersedes EN 14019:2004

English Version

Curtain Walling - Impact resistance - Performance requirements

Façades rideaux - Résistance au choc - Prescriptions de performance

Vorhangfassaden - Stoßfestigkeit - Leistungsanforderungen, Prüfverfahren und Klassifizierung

This European Standard was approved by CEN on 29 April 2016.

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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN 14019:2016) has been prepared by Technical Committee CEN/TC 33 “Doors, windows, shutters, building hardware and curtain walling”, the secretariat of which is held by AFNOR.

This document supersedes EN 14019:2004.

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 2016, and conflicting national standards shall be withdrawn at the latest by December 2016.

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

The revision of this European Standard clarifies requirements, impact positions and the test method, but it does not affect existing test evidence of EN 14019. Two informative annexes have been added.

This European Standard is part of a series of European Standards dedicated to curtain walling products.

This European Standard forms part of a series of curtain walling tests as defined in the product standard EN 13830.

According to the CEN/CENELEC Internal Regulations, the national standards organisations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

1 Scope

This European Standard defines performance requirements of curtain walling under impact load.

The mode of breakage of the glass has to be already assessed according to EN 12600.

Its criteria are targeted to safety in use and integrity of curtain walling in the event of sudden impact forces on the curtain wall surfaces. Compliance with the performance requirement is determined by the laboratory test.

It applies to those areas of curtain walling which face onto areas of human activity, either internally or externally and takes account of accidental impacts brought on by people going about their normal daily activities and impacts brought about by equipment and similar devices for maintenance, cleaning, repair and similar occasional activities.

It does not set out to define performance requirements of impact under exceptional circumstances such as acts of vandalism, vehicular collision, firearm projectiles, etc.

This standard will have no bearing whatsoever on any National Building / Health and Safety regulations which may exist and whose requirements have to apply separately and in parallel with these test performance requirements.

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.

EN 1630, *Pedestrian doorsets, windows, curtain walling, grilles and shutters - Burglar resistance - Test method for the determination of resistance to manual burglary attempts*

EN 13119, *Curtain walling - Terminology*

EN 12600, *Glass in building - Pendulum test - Impact test method and classification for flat glass*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 13119 and the following apply.

3.1

component dislodgement

breaking away of any curtain wall component from the main construction, to the extent that the whole or part component falls off

4 Failure criteria

4.1 The curtain wall shall safely absorb the impact loads and shall retain its function in fulfilling the following criteria:

4.1.1 no part exceeding the mass of 50g shall fall down;

4.1.2 no holing shall occur permitting a test block E2 according with EN 1630 (ellipse) to be passed through it;

4.1.3 permanent deformation of curtain walling framing members, including their connections and fixings, shall be accepted as far as no fracturing or rupturing that separates any framing member, connection or fixing into two or more fragments shall occur;

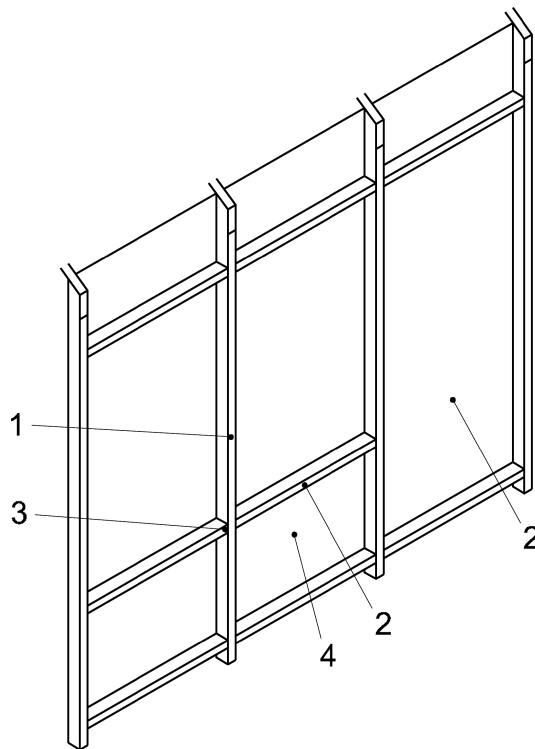
4.1.4 the test specimen shall not detach or dislodge;

4.1.5 any infill panels shall not detach or dislodge.

4.2 Glass products used as or incorporated in infill components shall be classified in accordance with EN 12600.

5 Impact load positions

For impact load positions see Figure 1.



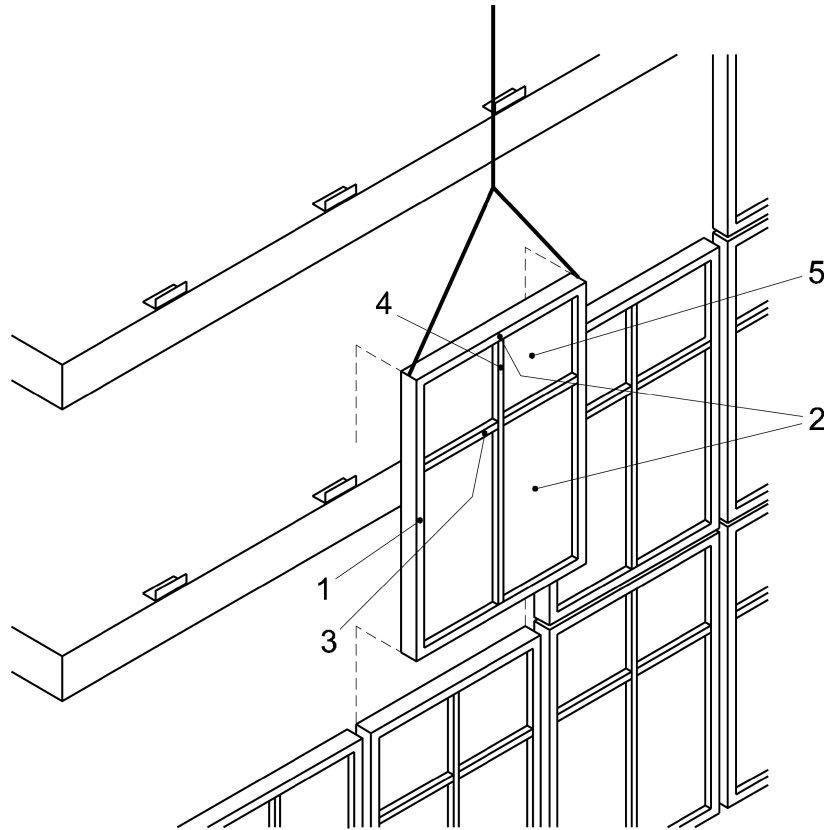
Key

- 1 Centre of mullion or component height between fixings (external only).
- 2 Centre width of transom of component (external, internal) at sill height and/or at spandrel height.
- 3 End of transom, 150 mm from junction with mullion (external, internal).
- 4 Centre of infill panel (external, internal).

If different mullion/transom/T-connector/infill panels are intended, all these variants have to be tested (in the most onerous combination)

NOTE The spandrel height has to be determined by the client.

Figure 1 — Illustration of impact load positions for stick construction



Key

- 1 Centre of modular frame, vertical between fixings (external only)
- 2 Centre of transom width (internal, external at sill height)
- 3 End of transom, 150 mm from junction with mullion (external, internal).
- 4 End of mullion or frame element, 150 mm distant from its end (external only).
- 5 Centre of infill panel (internal/external)

Figure 2 — Illustration of impact load positions of unitised construction

6 Test method

The test specimen should be a section of curtain wall a minimum of one storey height and of sufficient size to permit testing at all the specified test positions.

For each test position identified in Clause 5, where present, the classification impact is applied once followed by an impact of 100 mm drop height (see Figure A.1).

The test may start with a low potential energy and increase the drop height until the failure occurs or the maximum potential energy class is obtained.

Separate test positions could be used for internal and external tests.

The test specimen should be supported on a rigid structure using the same method of fixing as proposed for site installation. A sample used for watertightness testing will normally be suitable.

Storage and testing shall be carried out in a non-destructive environment within the ranges of 5 °C to 30 °C and 25 % to 75 % relative humidity.

The impactor as specified in EN 12600 shall be mounted on a horizontal or vertical axis, as best befits the requirements of access to the impact point. In addition wires, pulleys, hooks and suitable height adjusting devices are needed, as specified in EN 12600.

With the impactor hanging in its free state, adjacent to the impact point, attach the release hook to it. Raise the impactor, by means of the height adjusting device until the drop height is correctly set, as judged from a reference point on the impactor. At the drop height the suspension cable shall be taut, and the axis of the impactor and cable shall be in line.

Disengage the release hook allowing the impactor to swing freely until it strikes the test specimen perpendicular to the infill. The metal part of the impactor shall not make contact with the test piece during the impact.

Testing may start at the lowest drop height (see Tables 1 and 2) and increase up to the drop height required.

The drop height shall be set to an accuracy of ± 10 mm.

Inspect the test piece after each impact and note whether it complies with the requirements given in Clause 4.

If failure of an infill panel occurs, the test may be repeated with a replacement infill panel once.

In case of sloped or complex geometry curtain walling, the test method described in EN 12600 may be varied using chains, cables, straps etc. for the suspension of the impactor. The suspension system, however, may not inhibit the pendulum movement of the impactor.

If impact points are difficult to access (e.g. internal) in exceptional circumstances the angle between suspension cable and bracket may be less than 14° . A sufficient pendulum movement, however, shall be possible.

The impact resistance tests according to EN 14019 shall be performed before any other impact testing (e.g. hard body impactor).

7 Classification

The drop heights to be applied shall be selected from the performance levels given in Tables 1 and 2.

Table 1 — Internal impact classification

Test Class	Drop height (mm)
I0	Not tested
I1	200
I2	300
I3	450
I4	700
I5	950