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Windows and doors — Soft and heavy body impact — Test method, safety requirements and classification

National foreword

This British Standard is the UK implementation of EN 13049:2023. It supersedes BS EN 13049:2003, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/538/1, Windows and doors.

A list of organizations represented on this committee can be obtained on request to its committee manager.

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October 2023

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English Version

Windows and doors - Soft and heavy body impact - Test method, safety requirements and classification

Fenêtres - Choc de corps mou et lourd - Méthode d'essai, prescriptions de sécurité et classification

Fenster und Türen - Belastung mit einem weichen, schweren Stoßkörper - Prüfverfahren, Sicherheitsanforderungen und Klassifizierung

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Contents		Page
European foreword		3
1	Scope	4
2	Normative references	4
3	Terms and definitions	4
4	Apparatus	4
5	Preparation of test specimen	5
6	Test procedures	5
7	Requirements and classification	6
8	Test report	6
Bibliography		8

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European foreword

This document (EN 13049:2023) 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 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of an identical text or by endorsement, at the latest by April 2024, and conflicting national standards shall be withdrawn at the latest by April 2024.

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.

This document supersedes EN 13049:2003.

This document is one of a series of standards for windows and doors.

The revision of this document clarifies the test method; furthermore, it supplements the scope of the standard for pedestrian doors. It does not affect existing test evidence of EN 13049:2003. The main changes compared to the previous edition EN 13049:2003 are listed below:

- Clause 1: pedestrian doorsets have been included;
- Clause 5: review and clarification of preparation of the test specimen;
- Clause 6: supplement and clarification of testing procedures;
- Clause 7: introduction of a drop height for class 0 in Table 1;
- Clause 7: addition and clarification of assessment procedures for internal pedestrian doorsets;
- Clause 8: supplement of necessary description of test specimen.

Any feedback and questions on this document should be directed to the users' national standards body. A complete listing of these bodies can be found on the CEN website.

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1 Scope

This document specifies the test method, safety requirements and classification when determining the effect on a complete window or pedestrian doorset impacted with a soft and heavy body. Any secondary moving sashes, casements, leaves, mullions, transoms, T-connectors or fixed lights which can be mounted internally to the main casements or sashes, are intended to also be similarly tested and evaluated for the classification for the complete product.

The test applies to all types of infill of whatever materials including glass. It is not intended to classify the strength of the glass when used as an infill. It is intended to assess the interactions between all components of a window with particular regard to safety in use. It is also applicable to assess the ability of a doorset to keep in place glazed parts.

NOTE 1 The test method is aimed for glazed pedestrian doorsets with injury risk, but can also be used for other types of pedestrian doorsets if requested by the client.

NOTE 2 The test has been devised to suit all window or pedestrian doorset types, configurations and materials.

NOTE 3 For the classification of glass see EN 12600.

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 1627:2021, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Requirements and classification*

EN 1630:2021, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance to manual burglary attempts*

EN 12519, *Windows and pedestrian doors — 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 1627:2021 and EN 12519 apply.

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

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

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

4 Apparatus

The apparatus shall consist of a rigid subframe into which the complete specimen can be mounted using the fixing system and devices provided by the client.

The impactor as specified in EN 12600 shall be mounted on a horizontal or vertical axis, as appropriate for 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.

5 Preparation of test specimen

Storage and testing shall be carried out in a non-destructive environment within the ranges of + 10 °C to + 30 °C and 25 % to 75 % relative humidity. The test specimen shall be conditioned in this environment for at least 4 h prior to starting the test.

The test specimen shall be fixed as intended for use in accordance with the client's instructions without any twist or bends which can influence the test results. The impact surface shall be aligned vertically. The stiffness of the test rig and the fixing of the test specimen to it shall be sufficient to avoid adverse effects on the performance of the test specimen during testing.

The test specimen shall be brought into the defined closing condition, if openable in accordance with the client's requirements.

6 Test procedures

Operate any openable part of the test specimen five times immediately before testing.

Tests shall be performed separately, one impact on each test specimen. Test specimen may be impacted again, if the client accepts this. Select, e.g. by means of pre-tests or calculations, the most unfavourable impact point to strike. Typically, this will be one or more of the following:

- the centre of the infill/panel;
- a corner of the infill/panel;
- the centre of the longest edge of the largest area of the infill/panel;
- the centre of the shortest edge of the smallest area of the infill/panel;
- the centre width/height of glazing bar;
- the centre width of transom;
- the centre of the shortest mullion(s);
- the centre width of midrail and/or bottom rail;
- the centre of the longest edge of the stile.

NOTE The most unfavourable impact point is a point where it is most likely that damage as described in Clause 7 can occur.

The side of impact (opening face and/or closing face) shall be as specified by the client.

It is however possible to perform several tests on one test specimen. Damage from previous tests can be repaired by the client. If this is not possible, the test shall be performed on a separate test specimen.

In case of more than one infill, each infill may be assessed.

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 (see Table 1), as judged from a reference point on the impactor.

Disengage the release hook allowing the impactor to swing freely until it strikes the test specimen perpendicular to the impact point.

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

7 Requirements and classification

The drop height to be set shall be selected from Table 1. To qualify for a particular class the following requirements shall be met:

- the impact shall not result in any opening that allows the ellipsoid (template E2), as specified in EN 1630:2021, 6.7, to pass;
- the impact shall not in a dangerous manner (e.g. pointed or sharp edges) detach or dislodge any casement, sash or leaf of the test specimen or any hardware or infill/retaining components;
- the mass of any single dislodged part not exceeding 50 g per piece.

Table 1 — Impact levels/drop heights

Classification	1	2	3	4	5	
Drop height (mm)	100	200	300	450	700	950

When assessing the ability of an internal doorset to keep in place glazed parts (see EN 14351-2:2018, 4.3.1): when the door leaf comes off at the hinged side, this shall be considered as a fail. If the complete door leaf opens under the impact, this opening shall not be assessed as a fail. In that case, the closing edge of the door leaf may be held linear by additional means and the impact test may be repeated. The door leaf shall be maintained closed by a 300 mm stiff plate at lock height (where applicable) that is mounted on one side to the test rig (for each opening direction, if applicable).

When this provision has been used it shall be stated in the test report.

8 Test report

Prepare a test report ensuring that it shall positively identify the test specimens and record all parameters of the test procedure.

The following information shall also be recorded:

- name of the client;
- reference to this document;
- the name of the test laboratory;
- date of test;
- description of the specimen and dimensioned drawings of all relevant details of the test specimen including cross section; the fixing of the frame strikers (number of screws used for the fixing, and details into which material they were screw-fixed) shall be clearly depicted in these drawings;
- temperature and relative humidity at beginning of test;
- description of the tested closing condition(s);
- details of all impact points and directions of impact;

- drop height (mm);
- details of any damage during the test;
- results of the test including any observations that can have affected the result;
- classification of the test specimen according to Clause 7.

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Bibliography

- [1] EN 1628, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance under static loading*
- [2] EN 1629, *Pedestrian doorsets, windows, curtain walling, grilles and shutters — Burglar resistance — Test method for the determination of resistance under dynamic loading*
- [3] EN 14351-1, *Windows and doors — Product standard, performance characteristics — Part 1: Windows and external pedestrian doorsets*
- [4] EN 14351-2:2018, *Windows and doors — Product standard, performance characteristics — Part 2: Internal pedestrian doorsets*

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