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**Windows and doors — Determination  
of the resistance to soft and heavy  
body impact for doors**

*Fenêtres et portes – Détermination de la résistance au choc de corps  
mou et lourd pour les portes*

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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](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 162, *Doors, windows and curtain walling*.

This second edition cancels and replaces the first edition (ISO 8270:1985), which has been technically revised.

The main changes are as follows:

- the title has been revised;
- this document has been adapted to the current state of the art with Reference [1] as a basis;
- the technical content has been precised.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

# Windows and doors — Determination of the resistance to soft and heavy body impact for doors

## 1 Scope

This document specifies the method to be used to determine the damage caused by striking with a soft and heavy body, the face of a closed-door leaf fixed in its own door frame as part of a door set.

This document applies to all doors.

The method can also be used with respect to a door leaf submitted for a test in a frame, which the manufacturer considers appropriate to and typical for the intended utilization.

## 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.

ISO 22496, *Windows and pedestrian doors — Vocabulary*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 22496 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/>

## 4 General

Forces that can reasonably be expected from impacts by human bodies and substantial objects with similar characteristics should neither damage nor impair the normal performance of a door.

For manufacturers of door leaves whose products are not sold as part of a known door set, or where such door leaves can be used in a sliding door assembly, provision is made for claiming conformance with the relevant requirements by the testing of such door leaves in a typical frame. Nevertheless, the fact that a particular door leaf meets with the relevant requirements in this way does not necessarily mean that a door assembly incorporating that door leaf will meet the requirements.

## 5 Test apparatus

### 5.1 Test surround

The surround in which the specimen is tested, shall be sufficiently rigid to withstand the test load without deflecting to an extent likely to influence the test result.

## 5.2 Impact equipment

The impact body of a total mass of  $(30 \pm 0,6)$  kg consists of a spherical leather bag of diameter approximately 350 mm, containing dry sand of apparent density approximately  $1\,500\text{ kg/m}^3$  which passes through a sieve of 2 mm mesh.

Wires, pulleys, release hook and suitable height-regulating devices are also used..

## 5.3 Measuring equipment

A dial or digital gauge accurate to 0,01 mm is mounted at the centre of a reference bar capable of spanning the width of the door leaf.

## 6 Test specimens

Test specimens shall be stored and tested in a non-destructive environment within the ranges of 15 °C to 30 °C and 25 % to 75 % relative humidity.

Doors which are designed to be glazed, shall be supplied for testing with all glazing carried out in accordance with the door manufacturer's specification.

## 7 Procedure

The door leaf to be tested shall be closed and where applicable secured in accordance with its normal operating mode.

NOTE 1 In its normal operating mode, a door leaf can be unsecured, or secured by latch, lock, bolt or other means.

Identify the impact point. This shall occur at the centre of the door leaf. Where the impact point coincides with the handle, this shall be removed.

With the reference bar, measure any deviation in flatness across the width of the door leaf at the height of the impact point, to the nearest 0,1 mm.

Suspend the impact body as shown in [Figure 1](#) so that at rest it makes light contact with the surface of the door leaf and so that its centre of gravity is positioned on a line perpendicular to the door leaf at its centre. Raise the impact body so that the drop height  $h$ , with a tolerance of  $\pm 10$  mm, corresponds to the required impact energy. Release the impact body such that it strikes the door leaf at the impact point.

NOTE 2 Repetition of this operation necessitates re-shaping of the impact body.

Repeat the measurement of deviation in flatness across the width of the door leaf at the height of the impact point, to the nearest 0,1 mm.

## 8 Expression of results

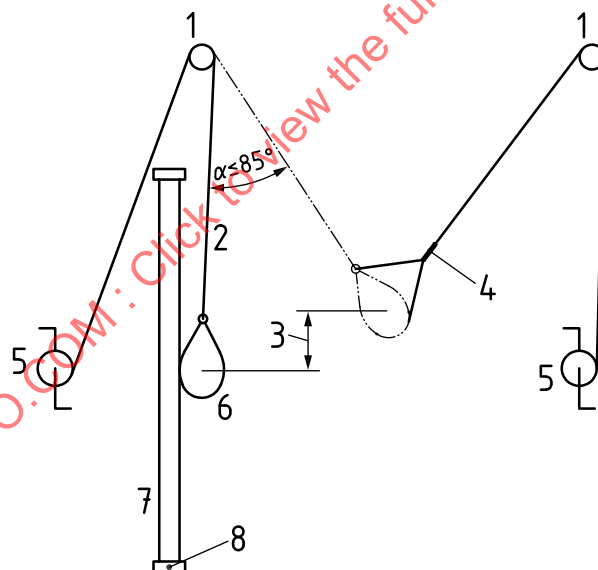
Record the residual deformation in flatness, across the width at the height of the impact point.

## 9 Test report

The test report shall contain the following information:

- a) reference to this document (ie. ISO 8270:202X);
- b) all necessary details to identify the door set or door leaf;

- c) all relevant details concerning the type, specified dimensions, materials, form and construction of the door set or door leaf, including the position of hardware;
- d) full details of the frame and hardware supplied if the assembly is not a door set;
- e) the position and size of any glazed or panelled areas;
- f) laboratory storage and testing conditions;
- g) the face or faces tested and number of impacts applied to each face;
- h) the impact energy in joules;
- i) the results expressed as in [Clause 8](#);
- j) details of any damage that appeared during the test;
- k) the method used (if the standard includes several);
- l) any deviations from the procedure;
- m) any unusual features observed;
- n) name of testing laboratory;
- o) date of test.



#### Key

- 1 pulley
- 2 wire
- 3 drop height,  $h \pm 10 \text{ mm}$
- 4 release hook
- 5 regulating device
- 6 impact body
- 7 door set
- 8 test rig

**Figure 1 — Test apparatus for soft and heavy body impact test and test principle**

## Bibliography

- [1] EN 949, *Windows and curtain walling, doors, blinds and shutters — Determination of the resistance to soft and heavy body impact for doors*

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