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**Glass containers — Resistance to vertical  
load — Test method**

*Réipients en verre — Résistance à la charge verticale — Méthode  
d'essai*

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## Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 8113 was prepared by the European Committee for Standardization (CEN) in collaboration with Technical Committee ISO/TC 63, *Glass containers*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

Throughout the text of this document, read “...this European Standard...” to mean “...this International Standard...”.

This second edition cancels and replaces the first edition (ISO 8113:1985), which has been technically revised.

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## Foreword

This document (EN ISO 8113:2004) has been prepared by Technical Committee CEN /TC 261 "Packaging", the secretariat of which is held by AFNOR, in collaboration with Technical Committee ISO/TC 63 "Glass containers".

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of an identical text or by endorsement, at the latest by September 2004, and conflicting national standards shall be withdrawn at the latest by September 2004.

Efficient packaging is of great importance for the distribution and the protection of goods and the environment. Insufficient or inappropriate packaging can lead to damage or wastage of the contents of the pack.

This standard is part of a series of standards for "Glass containers - Test methods":

- EN ISO 7458, *Glass containers — Internal pressure resistance — Test methods (ISO 7458:2004)*
- EN ISO 7459, *Glass containers — Thermal shock resistance and thermal shock endurance — Test methods (ISO 7459:2004)*
- prEN ISO 8106, *Glass containers — Determination of capacity by gravimetric method — Test method (ISO/FDIS 8106:2003)*
- EN ISO 8113, *Glass containers — Resistance to vertical load — Test method (ISO 8113:2004)*
- EN 29008, *Glass bottles — Verticality — Test method (ISO 9008:1991)*
- EN 29009, *Glass containers — Height and non-parallelism of finish with reference to container base — Test methods (ISO 9009:1991)*
- EN 29885, *Wide-mouth glass containers — Deviation from flatness of top sealing surface — Test methods (ISO 9885:1991)*

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



## 1 Scope

This European Standard specifies a method for determination of the resistance of glass containers to external force in the direction of the vertical axis.

## 2 Sampling

The test shall be performed on a predetermined number of containers. The containers used for the test shall not have been subjected to any other mechanical or thermal test which could affect their resistance.

## 3 Apparatus

**3.1** Press, or other suitable apparatus, with the following characteristics:

- a) The apparatus shall be capable of developing the necessary force and indicating this force by means of a pointer or recording device to an accuracy of at least 2,5 %.
- b) The apparatus shall consist of two horizontal flat steel pressure plates. The upper plate shall be self-aligning and the lower one shall be provided with centring marks on its surface.
- c) The apparatus shall be equipped with a protective cover, or each type of test container shall be provided with a sufficiently firm cylindrical cover suitable for its height which shall be slightly lower than the height of the test sample.

**3.2** Pads, for example cardboard or several sheets of paper, to prevent glass-to-metal contact under load.

In order to obtain an even load and to prevent glass-to-metal contact, pads shall be inserted between the glass surfaces and the metal pressure faces, e.g. plastic or rubber sheets, folded paper or cardboard or the bottle cap can be used.

## 4 Procedure

**4.1** The temperature of the sample shall not differ by more than 5 °C from the ambient.

**4.2** Special care shall be taken to ensure that there are no glass particles on the plate. Position a base pad (3.2) with the test container placed on it, in the centre of the lower plate. The centreline of the container shall be in line with that of the apparatus.

**4.3** Secure the container using the protective cover and at the same time, place the corresponding closure on the sealing surface of the container finish, if specified for the test. The test container shall be covered with a pad similar to the base pad situated under the test container unless a closure is used. Where either paper or a closure is used, new upper and lower pads shall always be used for testing each container.

**NOTE** The use of the corresponding closures is suitable, especially when metal closures with a sealing layer are used. In these cases, screw and bayonet closures should be locked manually.

**4.4** The approach speed or the average rate of increase in the force should be constant and shall be reported.

**4.5** The following procedures are carried out according to the type and the purpose of the test:

a) Pass test

- Increase the force applied to the specified value. When the specified value is achieved, the plates shall be withdrawn. After testing a predetermined number of the containers, the test is complete.

b) Total progressive test

- Increase the force applied progressively until the container breaks. The test shall be applied to all containers in the sample.

## 5 Safety requirements

This test procedure may be injurious to health if adequate precautions are not taken by the operator. Tests should be carried out in a safe manner as recommended.

## 6 Test report

The test report shall include the following information:

- a) reference to this European Standard,
- b) description and the capacity of the apparatus, and the test conditions according to 4.2,
- c) description and the number of containers in the sample tested and the sampling method,
- d) mention of the upper and lower pads applied or closure, if used,
- e) approach speed or the average rate of increase in the force,
- f) results, according to the type and the purpose of the test:
  - 1) for the pass test, in accordance with 4.5 a):
    - force achieved (loading)
    - number of containers which failed the test
  - 2) for the total progressive test, in accordance with 4.5 b):
    - force, expressed in kN, needed to break each container
    - mean value of these values,  $\bar{x}$
    - standard deviation,  $s$ ,
- g) date of test,
- h) location,
- i) signature of responsible person.