BRITISH STANDARD

BS EN 22248:1993
ISO 2248-1985
Incorporating Amendment No. 1

Complete, filled transport packages — Method for determination of resistance to vertical impact by dropping

The European Standard EN 22248:1992 has the status of a British Standard

UDC 621.798.1:620.165.78

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Packaging and Freight Containers Standards Committee (PKM/-) to Technical Committee PKM/501, upon which the following bodies were represented:

Association of Drum Manufacturers
British Fibreboard Packaging Association
Chemical Industries Association
Department of Trade and Industry (Laboratory of the Government Chemist)
Electronic Components Industry Federation
Glass Manufacturers' Federation
Institute of Packaging
Ministry of Defence
PIRA (The Research Association for the Paper and Board, Printing and Packaging Industries)
Society of Motor Manufacturers and Traders Limited
Telecommunication Engineering and Manufacturing Association (TEMA)
Timber Research and Development Association

This British Standard, having been prepared under the direction of the Packaging and Freight Containers Standards Committee, was published under the authority of the Board of BSI and comes into effect on
31 July 1986

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The following BSI references relate to the work on this standard:
Committee reference PKM/501
Draft for comment 84/42382 DC

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Amendments issued since publication

Amd. No.	Date of issue	Comments
7456	March 1993	Indicated by a sideline in the margin

Content

National foreword

This revision of this Part of BS 4826 has been prepared under the direction of the Packaging and Freight Containers Standards Committee and is identical with ISO 2248-1985 "Packaging — Complete, filled transport packages — Vertical impact test by dropping" published by the International Organization for Standardization (ISO). It supersedes BS 4826-4:1972 which is withdrawn.

In 1992 the European Committee for Standardization (CEN) accepted ISO 2248-1985 as European Standard EN 22248:1992. As a consequence of implementing the European Standard this British Standard is renumbered as BS EN 22248 and any reference to BS 4826-4 should be read as a reference to BS EN 22248.

Terminology and conventions. The text of the international standard has been approved as suitable for publication as a British Standard without deviation. Some terminology and certain conventions are not identical with those used in British Standards; attention is drawn especially to the following.

The comma has been used as a decimal marker. In British Standards it is current practice to use a full point on the baseline as the decimal marker.

Wherever the words "International Standard" appear, referring to this standard, they should be read as "British Standard".

Cross-reference

International standard	Corresponding British Standard
	BS 4826 Methods of test for complete, filled transport packages
ISO 2206-1972	Part 1:1972 Identification of package parts when testing (Technically equivalent)

The Technical Committee has reviewed the provisions of ISO 2233, a new edition of which is currently in preparation and to which reference is made in the text, and has decided that they are acceptable for use in conjunction with this standard.

A related British Standard is BS 4826 "Complete, filled transport packages" Part 2:1986 "*Method of conditioning for testing*".

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, the EN title page, pages 2 to 6, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 22248

November 1992

UDC 621.798.1:620.165.78

Descriptors: Packing, transport packing, complete – and filled packages, impact tests, drop tests

English version

Packaging — Complete, filled transport packages — Vertical impact test by dropping

(ISO 2248:1985)

Emballages — Emballages d'expédition complets et pleins —
Essai de choc vertical par chute libre
(ISO 2248:1985)

Verpackung — Versandfertige Packstücke —
Vertikale Stoßprüfung (freier Fall)
(ISO 2248:1985)

This European Standard was approved by CEN on 1992-10-30. 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 Central Secretariat 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart 36, B-1050 Brussels

Foreword

In 1991, ISO 2248:1985 *Packaging – Complete, filled transport packages – Vertical impact test by dropping* was submitted to the CEN Primary Questionnaire procedure.

Following the positive result of the CEN/CS Proposal ISO 2248:1985 was submitted to the Formal Vote.

The result of the Formal Vote was positive.

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 1993, and conflicting national standards shall be withdrawn at the latest by May 1993.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Scope and field of application

This International Standard specifies a method for carrying out a vertical impact test on a complete, filled transport package by dropping. It may be performed either as a single test to investigate the effects of vertical impact or as part of a sequence of tests designed to measure the ability of a package to withstand a distribution system that includes a vertical impact hazard.

2 References

ISO 2206, *Packaging — Complete, filled transport packages — Identification of parts when testing.*

ISO 2233, *Packaging — Complete, filled transport packages — Conditioning for testing.*

3 Principle

Raising of the test package above a rigid plane surface and releasing it to strike this surface (the "impact surface") after a free fall [1)]. The atmospheric conditions, the height of drop and the attitude of the package are predetermined.

4 Apparatus

4.1 *Lifting arrangement,* which will not damage the test package during either lifting or release.

4.2 *Means of holding the test package* prior to release in its predetermined attitude.[2)]

4.3 *Release mechanism,* to release the test package in such a way that its fall is not obstructed by any part of the apparatus before striking the impact surface (**4.4**).

4.4 *Impact surface,* horizontal and flat, massive enough to be immovable and rigid enough to be non-deformable under test conditions.

NOTE In normal circumstances, the impact surface provided shall be

— integral with a mass at least 50 times that of the heaviest package to be tested;

— flat, such that no two points on its surface differ in level by more than 2 mm;

— rigid, such that it will not be deformed by more than 0,1 mm when an area of 100 mm^2 is loaded statically with 10 kg anywhere on the surface;

— sufficiently large to ensure that the test package falls entirely upon the surface.

In addition, the apparatus shall meet the requirements and tolerances of clause **7**.

5 Package preparation

The test package shall normally be filled with its intended contents. However, simulated or dummy contents may be used, on condition that the dimensions and physical properties of such contents shall be as close as possible to those of the intended contents.

Ensure that the test package is closed normally, as if ready for distribution. If simulated or dummy contents are used, ensure that the normal method of closure is still employed.

6 Conditioning

The package shall be conditioned in accordance with one of the conditions described in ISO 2233.

7 Procedure

Whenever possible the test shall be carried out in the same atmospheric conditions as used for conditioning, where this is critical to the materials or application of the package. In other circumstances, the test shall be carried out in atmospheric conditions which are as near as practicable to those used for conditioning.

7.1 Lift the test package and hold it in the predetermined attitude (see annex) at a height within ± 2 % of the predetermined drop height as defined by the distance between the lowest point on the package at the time of release and the nearest point on the impact surface (**4.4**).

7.2 Release the test package from its predetermined attitude within the following tolerances:

— for face or edge drops: 2° maximum angle between the impacting face, or edge, and the horizontal surface;

— for edge or corner drops: the angle between a prescribed surface of the package and the horizontal surface ± 5° or ± 10 % of the angle, whichever is the greater.

The velocity at impact shall be within ± 1 % of that which would be achieved by a free fall.

[1)] In some circumstances, a completely free fall may not be possible; in such circumstances, the impact velocity shall be within 1 % of that which is achieved by a free fall.

[2)] The difference in behaviour of a sack, for example, suspended from the top or supported below in an end drop, could be significant. In such instances, the method of holding the package before dropping shall be described in the test report.

8 Test report

The test report shall include the following particulars:

a) reference to this International Standard;

b) number of replicate packages tested;

c) full description of the package, including dimensions, structural and material specifications of the package and its fittings, cushioning, blocking, closure or reinforcing arrangements;

d) description of contents — if simulated or dummy contents were used, full details shall be given;

e) gross mass of package and mass of contents, in kilograms;

f) relative humidity, temperature and time of conditioning, temperature and relative humidity of test area at time of test; whether these values comply with the requirements of ISO 2233;

g) the attitude in which the package was tested, stated in one of the ways given in the annex;

h) drop height, in millimetres;

j) type of apparatus;

k) any deviations from the test method described in this International Standard;

m) a record of the result, with any observations which may assist in correct interpretation;

n) date of the test;

p) signature of tester.

Annex

The predetermined attitude of the test package shall be expressed in one of the following ways, using the method of identification given in ISO 2206.

NOTE Where bungs, enclosures or fittings are present, the attitude at impact may be related to their position.

A.1 Parallelepipedal packages

A.1.1 *Impact on a face*

State face 1, 2, 3, etc.

A.1.2 *Impact on an edge*

State edge 1–2, 2–3, 3–4, etc. and the angle between one of two surfaces forming the edge and the plane of the impact surface;

or

state the edge, and that the centre of gravity of the test package tested shall be vertically above the point of impact;

or

state the edge, and that the two parallel edges of the test package nearest to the impact edge shall lie in a horizontal plane.

A.1.3 *Impact on a corner*

State corner 1–2–5, 3–4–6, etc. and the angles between two of the faces forming the corner and the plane of the impact surface;

or

state the corner, and that the centre of gravity of the test package shall be vertically above the point of impact.

A.2 Cylindrical packages of circular cross-section

In all instances, the centre of gravity of the test package shall be vertically above the point, line or plane of impact with the impact surface.

A.2.1 Impact on top or bottom faces.

A.2.2 Impact at any of the points 1, 2, 3 etc., on either the edge or rim.

A.2.3 Impact on any of the lines 1–2, 3–4, etc., parallel to the axis of the cylinder.

A.3 Sacks and bags

The centre of gravity of the sack shall be vertically above the face, end or side involved in the impact.

A.3.1 *Impact on a face*

State face 1 or 3.

A.3.2 *Impact on an end*

State end 5 or 6.

A.3.3 *Impact on a side*

State side 2 or 4.

A.4 Miscellaneous packages

The attitude of the test package shall be based on the most appropriate attitudes given in clauses **A.1**, **A.2** and **A.3**.

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Publications referred to

See national foreword.

BSI — British Standards Institution

BSI is the independent national body responsible for preparing British Standards. It presents the UK view on standards in Europe and at the international level. It is incorporated by Royal Charter.

Revisions

British Standards are updated by amendment or revision. Users of British Standards should make sure that they possess the latest amendments or editions.

It is the constant aim of BSI to improve the quality of our products and services. We would be grateful if anyone finding an inaccuracy or ambiguity while using this British Standard would inform the Secretary of the technical committee responsible, the identity of which can be found on the inside front cover. Tel: 020 8996 9000. Fax: 020 8996 7400.

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