BS EN 12574-2:2017

BSI Standards Publication

Stationary waste containers

Part 2: Performance requirements and test methods

National foreword

This British Standard is the UK implementation of EN 12574-2:2017. It supersedes BS EN 12574-2:2006 which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee B/508/1, Waste containers and associated lifting devices on refuse collection vehicles.

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

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Published by BSI Standards Limited 2017

ISBN 978 0 580 90164 5

ICS 13.030.40

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 28 February 2017.

Amendments/corrigenda issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 12574-2

February 2017

ICS 13.030.40

Supersedes EN 12574-2:2006

English Version

Stationary waste containers - Part 2: Performance requirements and test methods

Conteneurs fixes à déchets - Partie 2 : Exigences de performance et méthodes d'essais

Stationäre Abfallsammelbehälter - Teil 2: Anforderungen an die Ausführung und Prüfverfahren

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European foreword

This document (EN 12574-2:2017) has been prepared by Technical Committee CEN/TC 183 "Waste management", the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by August 2017, and conflicting national standards shall be withdrawn at the latest by August 2017.

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 12574-2:2006.

This European Standard is one part of the series of standards EN 12574 about "Stationary waste containers" comprising the following parts:

— *Part 1: Containers with a capacity up to 10 000 l with flat or dome lid(s), for trunnion, double trunnion or pocket lifting device — Dimensions and design;*

— Part 2: Performance requirements and test methods;

— Part 3: Safety and health requirements;

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1 Scope

This part of EN 12574 specifies the test methods for stationary waste containers (in the text also called containers) according to EN 12574-1:2017. It also specifies the target requirements to be reached either during or after the tests.

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 1501-1, *Refuse collection vehicles and their associated lifting devices - General requirements and safety requirements - Part 1: Rear-end loaded refuse collection vehicles*

EN 1501-2, *Refuse collection vehicles and their associated lifting devices - General requirements and safety requirements - Part 2: Side loaded refuse collection vehicles*

EN 1501-3:2008, *Refuse collection vehicles and their associated lifting devices - General requirements and safety requirements - Part 3: Front loaded refuse collection vehicles*

EN 1501-5, *Refuse collection vehicles - General requirements and safety requirements - Part 5: Lifting devices for refuse collection vehicles*

EN 10346, *Continuously hot-dip coated steel flat products for cold forming - Technical delivery conditions*

EN 12574-1:2017, *Stationary waste containers - Part 1: Containers with a capacity up to 10 000 l with flat or dome lid(s), for trunnion, double trunnion or pocket lifting device - Dimensions and design*

EN ISO 105-B02, *Textiles - Tests for colour fastness - Part B02: Colour fastness to artificial light: Xenon arc fading lamp test (ISO 105-B02)*

EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles - Specifications and test methods (ISO 1461)*

EN ISO 4892-2, *Plastics - Methods of exposure to laboratory light sources - Part 2: Xenon-arc lamps (ISO 4892-2)*

EN ISO 8256, *Plastics - Determination of tensile-impact strength (ISO 8256)*

ISO 2081, *Metallic and other inorganic coatings - Electroplated coatings of zinc with supplementary treatments on iron or steel*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12574-1:2017 apply.

4 Tests

4.1 General

The following tests refer to EN 12574-1:2017.

Before and after the tests a visual inspection of the container shall be done for the purpose of:

a) checking that the container is not damaged and has no visual defect;

b) checking that the manufacturing characteristics of the container to be tested are those specified in EN 12574-1:2017;

c) comparing the condition of the container before and after the sequence of tests.

After completing the tests some deformation of the container is permissible, however, it shall remain entirely functional.

4.2 Control before the tests

4.2.1 Visual aspects

Conformity of the container to EN 12574-1:2017, no damage, no cracks, bubbles, large flashes or sharp edges shall be present. No surface defects (unsmooth areas; trails in colour) perceivable from a distance of 1 m by a naked eye shall be visible.

4.2.2 Correspondence with EN 12574-1:2017

4.2.2.1 Components

Body, lid, wheels and other fittings shall be tested in line with the relevant container standard.

4.2.2.2 Sizes and dimensions

Dimensions of the containers and components shall correspond to EN 12574-1:2017.

4.2.2.3 Capacities

Capacities of the container and its parts shall correspond to EN 12574-1:2017.

a) For the body, by tank method (see 4.2.2.4), up to 1 700 l, and by calculation for containers over 1 700 l;

b) for the lid, if possible by tank method (see 4.2.2.4), if not by calculation;

c) for the container, add the results obtained in a) and b) minus any duplicated capacities.

4.2.2.4 Tank method

The test equipment shall consist of a tank with sufficient capacity to receive the container to be tested.

The test procedure is as follows:

a) place the empty container in a tank, the container shall not be inclined;

b) simultaneously fill the tank and the container with water at a temperature of (15 ± 5) °C;

c) measure the quantity of water inside the container.

The result of measurement shall be ± 1 % of the stated capacity of the container.

4.2.3 Masses limit deviations

The limit deviations on the claimed container mass are ± 5 % for all materials.

4.2.4 Colour

The colour shall be defined and agreed upon between customer and supplier.

4.2.5 Marking

The marking of the container shall correspond to EN 12574-1:2017, Clause 10.

4.3 Control after the tests

In spite of variations in deflection and sizes, it shall be possible to lift and tilt the container loaded according to 4.5 with nominal load safely on a designated lifting device and to move the container on its wheels if any.

4.4 Conditions of the tests

The tests shall be carried out at the following temperatures:

T_1 = (23 ± 5) °C

T_2 = (-18^{0}_{-2})°C.

The minimum duration of conditioning before testing shall be 12 h. If the test is carried out outside the conditioned room and if the duration of the test is more than 5 min, then for each 5 min period of testing the container shall be reconditioned for at least 15 min before continuing the test.

For special purposes a temperature lower than −18 °C or higher than +23 °C can be agreed; in this case it shall be indicated in the test report.

4.5 Test load

For the calculation of test loads either of the two following density values shall be taken:

— 0,25 kg/dm^3 for light waste (e.g. for plastics, plastic bottles, flasks, mixed waste);

— 0,40 kg/dm^3 for heavy waste (e.g. for glass, paper, organic waste, cardboard).

The test load shall be the value of density as above multiplied by nominal volume and shall be HDPE granules in 25 kg bags having a specific mass of 0,5 kg/dm^3 but no more than 2 500 kg.

4.6 Tests on the containers

4.6.1 General

All tests shall be carried out on new containers, as per the sequence of tests in 4.10.4.

4.6.2 Impact test by ball drop

The ball drop test is not compulsory for steel containers.

The ability of the sensitive points such as welds and corners of the container to resist under impacts at temperature T_2 shall be tested.

The stationary containers shall stand on their wheels (if they are fitted) or on their supports.

Ball drop test shall be carried out using a 5 kg steel cylinder, diameter 65 mm, with hemispheric end radius of 32,5 mm. The steel cylinder is guided in a vertical pipe with a slot or with holes in order to allow the air to escape during the drop.

The following areas of containers shall be tested by impact test according to the conditions shown below:

a) on the inside of the bottom:

   1) at least 3 points beginning at the injection point(s) (less than 20 mm from sprue point) and other potentially weak points (i.e. drain holes for instance);

   2) with a drop height of 1,5 m;

   3) with a frequency of 3 times per measuring point.

b) at protrusions on the body (handle, top rim, etc.), junctions between lid and body, hinges at the lid and protruding areas on the lid:

   1) with a drop height of 0,8 m; and

   2) with a frequency of 2 impacts per measuring point.

After tests, no permanent deformations or ruptures capable of hampering designed use are allowed.

The device shall be according to Figure A.1.

A test of segments is allowed with segments of approximately a quarter of a square metre.

At least the following critical area shall be sawn from the container and shall be tested:

— positioning wheel suspensions (see area 1 in Figure 1): this area shall be cut out from the bottom at a height of approximately 500 mm:

— frontal receiver (see area 2 in Figure 1): both corner parts shall be tested. The area should be 300 mm × 300 mm;

— hinge area (see area 3 in Figure 1): both corner parts shall be tested. The area should be 300 mm × 300 mm;

— lid (see area 4 in Figure 1): an area from the hinges to the injection points shall be tested.

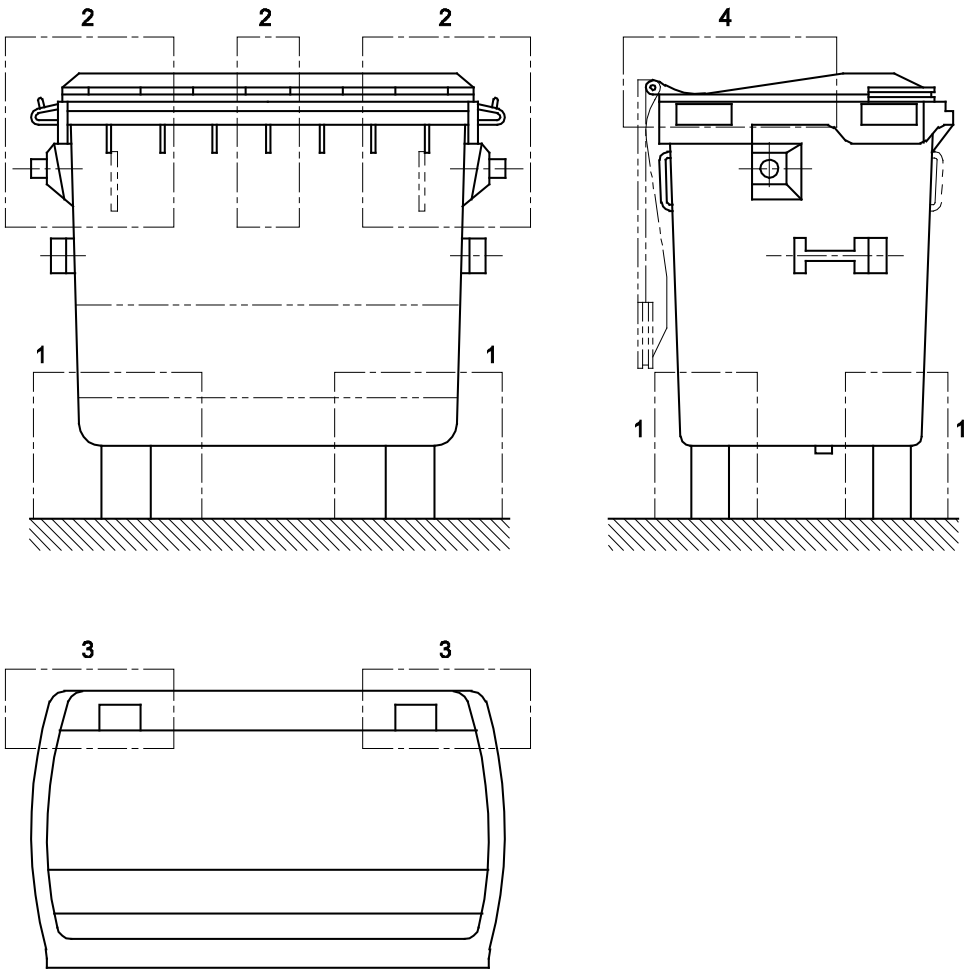

Figure 1 — Segments to be tested

4.6.3 Impact on an inclined plane

The stationary containers shall be tested with impact on each wall of the body and on each corner to check the resistance to straining and breaking of sensitive areas, including protruding areas and fittings. The test conditions shall be:

— temperature T_1;

— ballast according to 4.5;

— impact against a wall perpendicular to the direction of movement;

— a total of 16 impacts according to (the sequence in) Table 1.

During the procedure the lid shall be closed. The loaded container shall be placed on a trolley with an inclination of 10° (ten degrees) (relative to the horizontal). Precautions shall be taken to avoid accidental tipping of the container during the test (see Figure B.1).

An example of suitable apparatus is shown in Annex B.

Other apparatus could be used if it allows the same impact and velocity conditions.

The impact velocity shall be 1,85 m/s when one face is tested and 1,3 m/s when one corner is tested.

The vertical faces of the container shall be numbered from 1 to 4, the face marked 1 being that which interfaces with the RCV. Corners are marked 1.2, 2.3, 3.4 and 4.1.

After completing the tests some deformation of the container is permissible, however, it shall remain entirely functional.

Table 1 — Sequence of the lateral impacts

Impact N°	Face or corner tested	No of impacts
1 to 2	Face 1	2
3 to 4	Corner 1.2	2
5 to 6	Face 2	2
7 to 8	Corner 2.3	2
9 to 10	Face 3	2
11 to 12	Corner 3.4	2
13 to 14	Face 4	2
15 to 16	Corner 4.1	2

4.7 Stability test

The static stability of the empty and loaded containers on a slope of 10° (ten degrees) to the horizontal shall be tested at first on empty containers and after that on containers filled with the nominal load.

The test shall be carried out in still air conditions.

For 4-wheeled containers (for positioning only), the brakes, if any, should prevent them from rolling. Other arrangements shall be made to prevent containers from sliding or rolling without hindering tipping.

4.8 Dynamic tests

4.8.1 General

The aim of these tests is to check the handling and immobilization of the containers.

4.8.2 Pulling test

The strength required to start and maintain the container movement is to be measured. The pulling force defined as horizontal force is measured and the result is to be stated in the instruction for use.

The test shall only be carried out on empty containers with 4 wheels for positioning purpose only.

The maximum forces for sustained pulling shall not exceed 285 N.

In order to get comparable results all forces tests shall be carried out under the following conditions:

— new container;

— ground shall be a plane, smooth concrete horizontal surface [slope = 1° (one degree) maximum];

— pulling force shall generate a speed of 0,1 m/s ± 0,005 m/s;

— pulling distance shall be 3 m minimum;

— temperature in test area and of the tested container shall be T_1;

— total tolerance range of the equipment shall be ± 3 % of the measured value;

— wheels of the container, before every test, shall be aligned in the pulling direction. The direction block, if fitted, is in operation;

— tests shall be carried out 3 times.

4.8.3 Immobilization test

On a slope of 10° (ten degrees), the container under load shall not roll when the device is applied.

4.9 Lifting-tilting tests

4.9.1 General

This test checks that the container fits well on the lifting-tilting systems in agreement with the relevant part of EN 1501-1, EN 1501-2, EN 1501-3 and EN 1501-5.

The apparatus shall be a compatible standardized lifting device. The container and the lifting device are on the same plane, on even ground. The test should be carried out under normal service conditions and withstand the strength occurring from emptying operations.

4.9.2 Lifting-tilting empty container

This is a preliminary test to be done after visual inspection of the container and before the other tests.

The test is carried out on an empty container with the lid(s) closed.

A minimum of five lifting-tilting cycles should be completed without damage or malfunction.

4.9.3 Lifting-tilting of the loaded container

The test shall be carried out under the following conditions:

— test load according to 4.5;

— device to prevent the test load from being ejected during the test;

— temperature T_1;

— at least 100 cycles shall be made;

— lifting devices in agreement with the relevant parts of EN 1501;

— container shall be interlocked to the lifting device during the entire cycle.

After completing the test it shall be possible to position the container on the lifting device without lifting it by hand.

After completing the test no permanent deformation or abnormal distortion of the container causing premature ageing and no changes in dimensions that would give handling and lifting difficulties shall appear.

4.10 Miscellaneous tests

4.10.1 Internal stress-cracking tests (for thermo plastics only)

The following procedure tests the level of internal stress that can affect some moulded plastic parts. The test shall be carried out under the following conditions:

— tank large enough to include the whole container;

— water bath with 2 % to 3 % by volume of active strong detergent[1)];

— bath temperature of 70 °C ± 3,5 °C;

— immersion time in the bath shall be 48 h.

After completing the test there shall be no cracks or tears in such areas as front rim, handles, grips, hinges, wheel junctions, injection points, frontal receiver, reinforcing ribs and rib edges that affect the use of the container.

A test of segments is allowed with segments of approximately a quarter of a square metre.

At least the following critical area shall be sawn from the container and shall be tested:

— positioning wheel suspensions (see area 1 in Figure 1): this area shall be cut out from the bottom at a height of approximately 500 mm;

— frontal receiver (see area 2 in Figure 1): both corner parts shall be tested. The area should be 300 mm × 300 mm;

— hinge area (see area 3 in Figure 1): both corner parts shall be tested. The area should be 300 mm × 300 mm;

— lid (see area 4 in Figure 1): an area from the hinges to the injection points shall be tested.

4.10.2 Corrosion test

The container shall be resistant to corrosion in accordance with the state of the art. It is a task of the manufacturer to use surface treatment or materials that guarantee this performance.

Bodies, lids and flaps, hot dip galvanized after completion, and other hot dip galvanized parts shall meet the requirements of EN ISO 1461.

Zinc electro-plated parts shall meet the requirements of ISO 2081.

Weld-less bodies, lids, flaps and parts made out of continuously hot-dip zinc coated steel sheets shall meet the requirements of EN 10346.

4.10.3 Weathering

This test applies only to thermoplastic containers or components. The test shall be carried out according to Annex C.

The material tested shall contain all the additives of the basic plastic at the rate used to mould the container: stabilizer, pigments or colorants, and, if any, fillers, other plastic etc. These additives may influence the effects of weathering on the plastic.

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1) A suitable detergent is nonyl-phenol-etoxilate with a number of ethylene oxide (EO) mol greater than or equal to 9.

The results of weathering on plastic containers shall include:

— ageing of the plastic material;

— changes in colour.

4.10.4 Test method with child mannequin for containers with sliding mobile flap

4.10.4.1 General

The test with child mannequin is not applicable in the following cases:

— Waste container with hinged flap(s) as defined in EN 12574-1:2017;

— Waste container with locked lid (with apertures, with lid open only during emptying operation).

4.10.4.2 Equipment

— A child mannequin in compliance with an appropriate European Regulation[2)] size corresponding to 10 years old. The child mannequin is dressed with a thin sweatshirt made of at least 90 % cotton. The child mannequin is wearing the hood.

— A parallel piped-shaped plastic box (dimensions: length 600 mm × width 400 mm × height 320 mm).

4.10.4.3 Test method

The test described below shall be performed five times for each of the following three child mannequin positions in relation to the container rim:

— centre;

— left hand side;

— right hand side.

The untested lid braked container is placed on a hard concrete plane with an inclination of 1° maximum to the horizontal.

Position the legs of the child mannequin on the plastic box, such that the head and arms are inside the container for the centre position and one arm inside the container for the lateral position. Close the lid manually until it stops without any unlocking. Remove the box by device at a speed of 0,5 m/s.

4.10.4.4 Acceptance criteria

In each of the three positions, in any sequence of the test, the child mannequin shall fall from the container when the plastic box is removed.

It is acceptable for the child mannequin's head to remain suspended for an amount of time not to exceed 2 s.

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2) ECER 44: European Regulation N° 44 incl. amendment 1; uniform provisions concerning the approval of retaining devices for child occupants of power-driven vehicles ("child restraints").

4.10.5 Test for locked lid

The force required for unlocking a locked lid shall be measured. The pulling test force of 500 N shall be applied in the direction of lid opening and measured by a tension meter.

The force shall be applied progressively reaching the maximum force in not less than 5 s.

The test force shall be maintained for 30 s continuously.

The test shall be performed three times for each of the following positions in relation to the lid:

— centre;

— left hand side;

— right hand side.

In each of the positions of the test, the lid shall maintain the original locking position. Small plastic deformation or a maximum opening are accepted.

The maximum opening, during the test, shall never exceed 50 mm in any position.

After the tests the lid and the complete container shall pass the lifting-tilting test.

4.10.6 Sequence of the tests

The sequence of the tests on each sample is defined by Table 2.

Table 2 — Sequence of the tests

Sub-clause	Test	Stationary containers				
		Sample 1		Sample 2		Other samples
		plastic	metal	plastic	metal	
4.2.1	Visual aspects	0	0	-	-	-
4.2.2.2	Sizes and dimensions	1	1	-	-	-
4.6.2	Impact test by ball drop	-	-	1	-	-
4.6.3	Impact on an inclined plane	7	7	-	-	-
4.7	Stability test	4	4	-	-	-
4.8.2	Pulling test	2	2	-	-	-
4.8.3	Immobilization test	5	5	-	-	-
4.9.2	Lifting-tilting empty container	3	3	-	-	-
4.9.3	Lifting-tilting of the loaded container	6	6	-	-	-
4.10.1	Internal stress-cracking tests (for thermo plastics only)	-	-	-	-	S [a]
4.10.2	Corrosion test	-	-	2	2	-
4.10.3	Weathering	-	-	-	-	S
4.10.4	Child mannequin	1	1	-	-	-
4.10.5	Locked lid	1	1			

[a] S means special new components:
- for internal stress: on body and lid;
- for weathering: body and lid, or specimen of them or standardized specimen.

5 Tests report

The tests report shall include the following information:

a) name and place of the testing body;

b) testing date;

c) test conditions according to EN 12574-2:2017;

d) description of the test containers (manufacturer, designation, others);

e) number of the test containers (see 4.10.6);

f) type of testing equipment;

g) stipulated values mentioned in 4.6.2 (ball drop), 4.6.3 (impact), 4.8.2 (pulling) and the stipulated corrosion or/and weathering test for relevant materials;

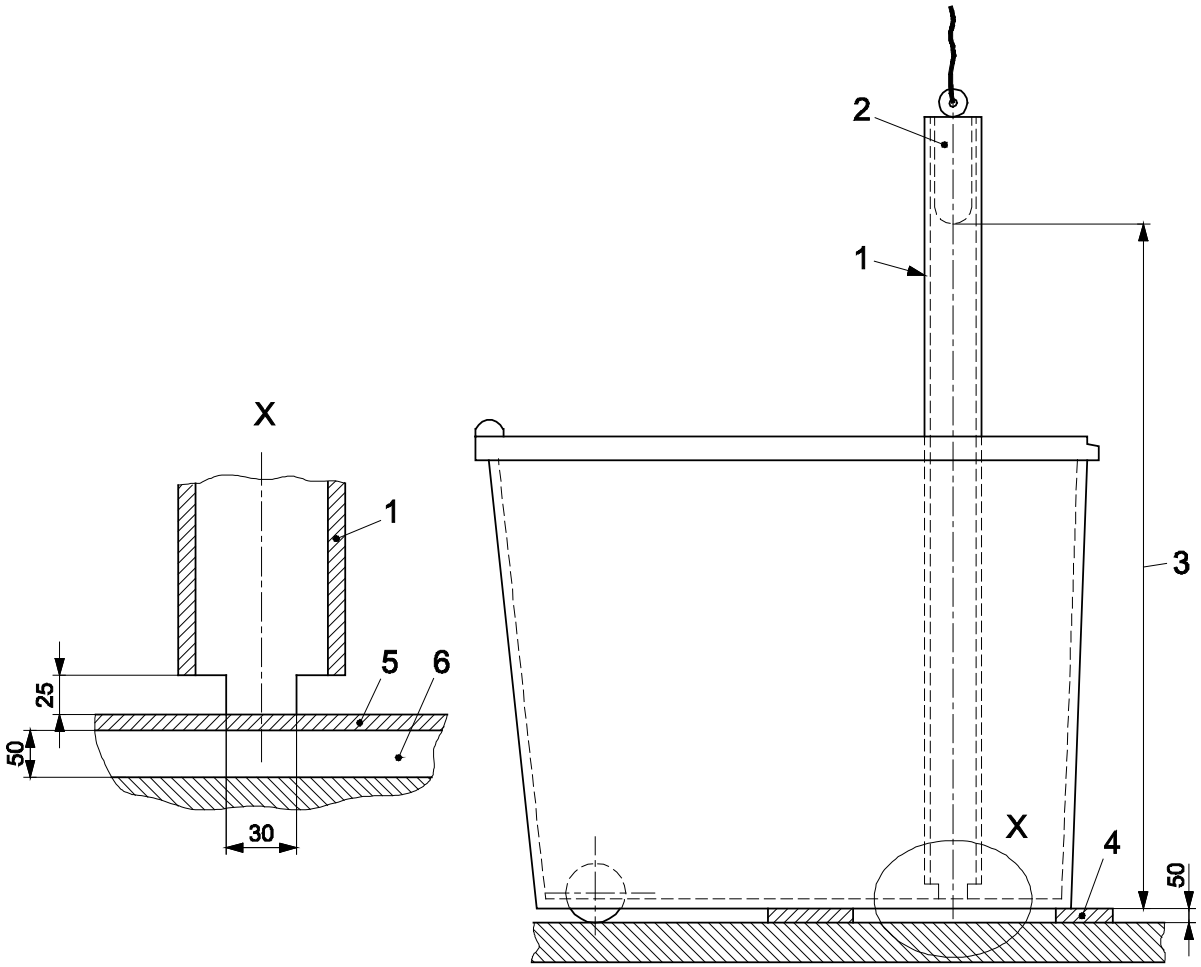
h) result of each test;

i) any deviation from the test conditions of this European Standard.

Annex A
(normative)

Device for ball drop test

Dimensions in millimetres



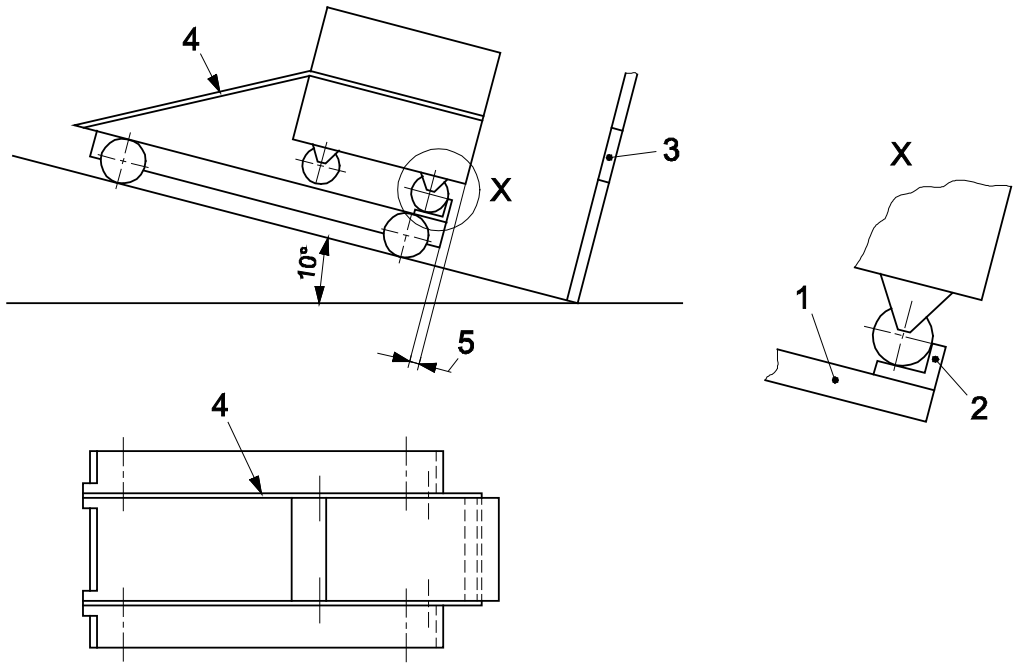
Key

1 vertical pipe (inside diameter: 70 mm)
2 steel cylinder (diameter: 65 mm; 1 hemispheric end mass: 5 kg)
3 fall height
4 steel plate to support the base of the container along the edge
5 container bottom
6 clearance

Figure A.1 — Device for ball drop test

Annex B
(informative)

Apparatus for lateral impact test on inclined plane



Key

1 trolley
2 steel angle
3 hole in the impact wall to allow the trunnion to pass through
4 ties
5 overhang

Figure B.1 — Apparatus for lateral impact test on inclined plane

Annex C
(normative)

Weathering tests

Weathering tests can be carried out as:

a) Outdoor weathering:

   1) exposure of containers and samples (according to EN ISO 4892-2);

   2) in an area giving, at least, the radiation foreseen in use. (For instance total 0,8 MWs/cm^2 in 3 years is 64 kLy: Northern Europe).

b) Artificial (accelerated) weathering test (xenon test - according to EN ISO 4892-2).

Though correlation between the results with “natural” and “artificial” experiences is difficult; 2 000 h of xenon arc radiation is needed to have roughly a total irradiation of 0,8 MWs/cm^2.

Result:

After testing with specimen of 3 mm thickness, the value of the impact tensile strength shall not be below 50 % of the initial value. The determination of the tensile-impact strength shall be effected on sample-type 3 according to EN ISO 8256.

To estimate the resistance of the colour to bleaching according to EN ISO 105-B02, the colour contrast shall not exceed level four.

Annex D
(informative)

A–deviations

A-deviation: National deviation due to regulations, the alteration of which is for the time being outside the competence of the CEN/ CENELEC member.

This European Standard does not fall under any Directive of the EU.

In the relevant CEN/ CENELEC countries these A- deviations are valid instead of the provisions of the European Standard until they have been removed.

DENMARK

EN 12574-1:2017, EN 12574-2:2017 and EN 12574-3:2017 do not fulfil the national Danish legislation regarding requirements for health and safety. This legislation is based on EEC-Directive 89/391/EC of 12 June 1989 and EEC-Directive 90/269/EEC of 29 May 1990.

The Danish legislation is written down in “Executive Order No. 867 of 13 October 1994 concerning Performance of Work” and in “Executive Order No. 1164 of 16 December 1994 concerning Manual Handling” both given by the Minister of Work. The Legal understanding of the Executive Orders are written in the Danish Working Environment Service (WES) guidelines. WES-guideline No. 4.1.0.1 of 1993 describes “Manual handling and transportation of domestic garbage” and No. 4.1.0.2 describes “Construction of technical systems and equipment for handling domestic garbage” (former WES circular-order No. 10/1990).

Therefore the manual handling and use of containers described in EN 12574-1:2017 to EN 12574-3:2017 in Denmark can be met with additional requirements.

Bibliography

[1] EN 840-5, *Mobile waste and recycling containers - Part 5: Performance requirements and test methods*

[2] EN 12574-3:2017, *Stationary waste containers - Part 3: Safety and health requirements*

[3] EN ISO 877, *Plastics - Methods of exposure to direct weathering, to weathering using glass-filtered daylight, and to intensified weathering by daylight using Fresnel mirrors (ISO 877)*

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