BRITISH STANDARD

BS EN
13590:2003

Packaging — Flexible carrier bags for the transport of various retail goods — General characteristics and test methods for the determination of volume and carrying capacity

The European Standard EN 13590:2003 has the status of a British Standard

ICS 55.080

British Standards

National foreword

This British Standard is the official English language version of EN 13590:2003.

The UK participation in its preparation was entrusted by Technical Committee PKW/5, Primary and transport packaging, to Subcommittee PKW/5/26, Packaging made from flexible materials, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

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

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English version

Packaging -Flexible carrier bags for the transport of various retail goods -General characteristics and test methods for the determination of volume and carrying capacity

Emballage - Sacs en matériau souple pourle transport de marchandises de detail variees -Caractéristiques génétiques et méthodes d'essai pourg l a Détermination du volume et de la capacité de transport

Verpackung -Tragetaschen flirden Transport verschiedener Einzehandelsguter-AIgem eine Eigenschaflen und P**riifi/erfehiEn**fiirdisBestmmungdes Volumens und derTragekapaziat

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Contents

Foreword

This document (EN 13590:2003) has been prepared by Technical Committee CEN/TC 261 "Packaging", the secetariat 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 September 2003, and conflicting national standards shall be wihdrawn at the latest by September 2003.

Annex A is normative.

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

Introduction

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

1 Scope

This European Standard specifies general characteristics and test methods for determination of volume and carrying capaciy of flexible carrier bags with handles for transport of various unspecified retail goods.

For specific retail goods there should be an agreement between supplier and buyer about the application of this standard.

This standard is applicable to carrier bags made of paper, thermoplastic material and or any other flexible material.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed here after. For dated references, subsequent amendments to or revisions of any of these publications appty to this European Standard only when incorporated in it by an amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN ISO 2233, *Packaging-Complete filled transport packages and unit loads-Conditioning for Testing (ISO 2233-2000).*

EN ISO 8367-1, *Packaging-Dimensional tolerances for general purpose sacks - Part 1: Paper sacks* (ISO 8367- 1-1993).

EN ISO 8367-2, *Packaging - Dimensional tolerances for general purpose sacks - Part 2: Sacks made from thermoplastic flexible film* (ISO 8367-2:1993).

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1
gusset
fold inserted in the longitudinal edge of a tube or bag

3.2
base gusset
fold inserted in the bottom of the bag

3.3
tube
one or more plies in the form of a flattened cylinder cut into prescribed lengths

3.4
ply
film or sheet of flexible material, or combination of such materials, forming the walls of a bag

3.5
length of bag, *a*
greatest distance between the transverse edges of the flat bag, perpendicular to the bottom

3.6
width of bag, *b*
distance between the longitudinal edges of the flat bag, gusset not included, parallel to the bottom

3.7
width of gusset, e
distance between the external creases of the unfolded gusset

3.8
width of bottom, *c*
distance between the two bottom edge folds or the external creases of the base gusset, measured at the centre, parallel to the bag's length

3.9
handle
device forming part of the bag allowing the insertion of hands for the easy carrying of a bag

3.10
length of handle, *d*
overall length from the top to the maximum possible filling height of the bag

3.11
width of handle, *f*
minimal width of a handle measured on the flat bag

4 General

4.1 Material

The materal shall be agreed between supplier and buyer.

The carrierbags may be made of paper, thermoplastic material and or any other flexible material.

NOTE Materials should be chosen and joined together in such a way that recovery is promoted.

4.2 Shape and dimensions

The shape and dimensions shall be agreed between suppler and buyer.

This standard applies to carrier bags wih any shape and dimension. Bags may be provided wih gussets.

Some examples ***are*** shown in Figure 1, including reference to the definitions given in paragraph 3.

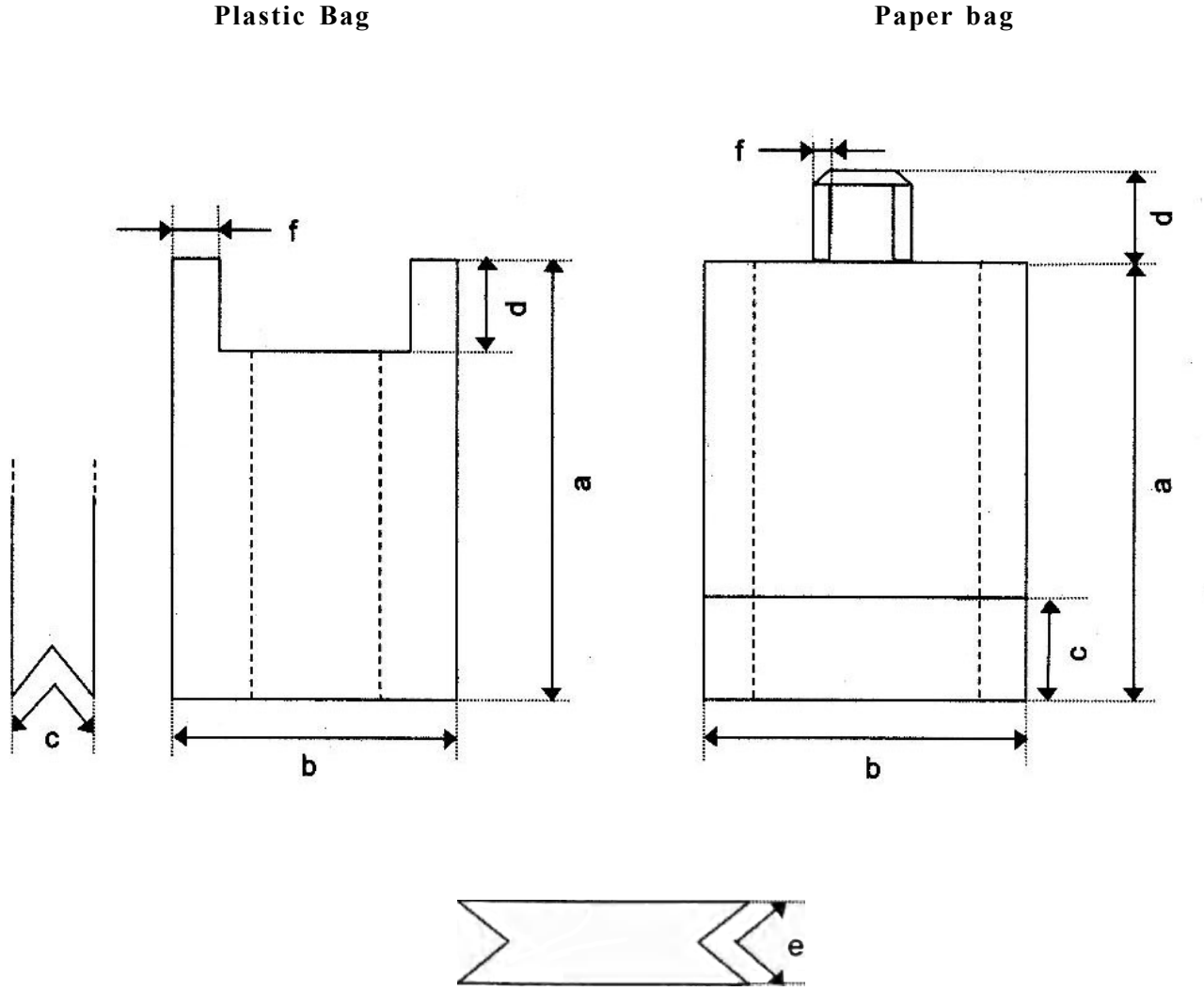


Figure 1 — Example of carrier bags to illustrate definitions

For all dimensions, if not otherwise agreed, the general values of tolerances shall be in accordance wih EN ISO 8367-1 or EN ISO 8367-2.

The width of handles shall be such that they can fulfill their carrying purposes.

4.3 Volume

The volume shall be agreed between supplier and buyer.

The volume of the carrier bag shall be determined in accordance with the test method given in ***5.5.1***.

4.4 Carrying capacity

The carrying capacity shall be agreed between supplier and buyer.

The carrying capaciy of the carrier bag shall be determined in accordance wih the test method given in ***5 5 2***.

5 Test methods

5.1 Sampling

ln order to assure the performance of the bags produced, a type test has to be done once for each type with at least 100 bags manufactured under normal industrial conditions selected at random.

5.2 Conditioning

The samples shall be conditioned and tested in accordance wih EN ISO 2233, condition G, ie. temperature 23 °C ± 2 °C (wih relative humidity 50 % ± 5 % for bags sensitive to humidity).

5.3 Filling material

5.3.1 Filling material for the determination of the volume

The filling material used for testing the volume of carrier bags consist of plastic granules wih bulk specific mass between 500 kg/m^3 and 600 kg/m^3

For the determination of bulk density a 1 litre capaciy cylinder wih an inner diameter of 75 mm ± 5 mm is filled to the top wih the plastic granules.

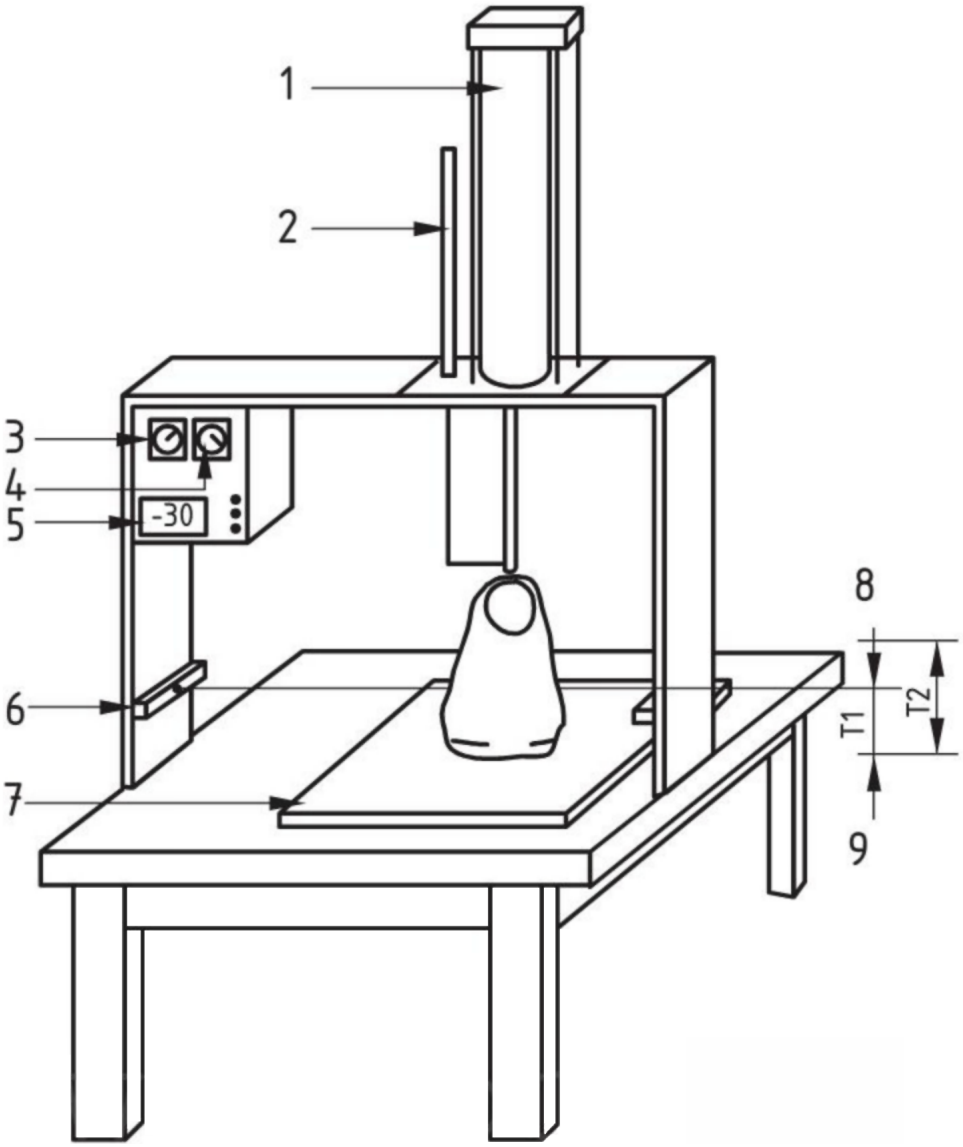
The cylinder content is compacted by impacting the cylinder twice onto a table and then the volume is measured. The granules are weighted and the bulk specific mass is calculated.

5.3.2 Filling material for testing the carrying capacity

The filling material used for testing the carrying capacity of carrier bags shall consist of high density polyethylene (HDPE) cylinders as specified in **annex A**.

5.4 Equipment

An example of equipment for testing the volume and the carrying capacity is shown in Figure 2. This equipment tests one carrier bag at a time



Key

1	Lifting cylinder	2	Positioner	3	Time 1
4	Time 2	5	Number of lifts	6	Photocell
7	Surface: Laminated fibre board	8	Upper turning point	9	Lower Turning Point

Figure 2 — Example of testing equipment

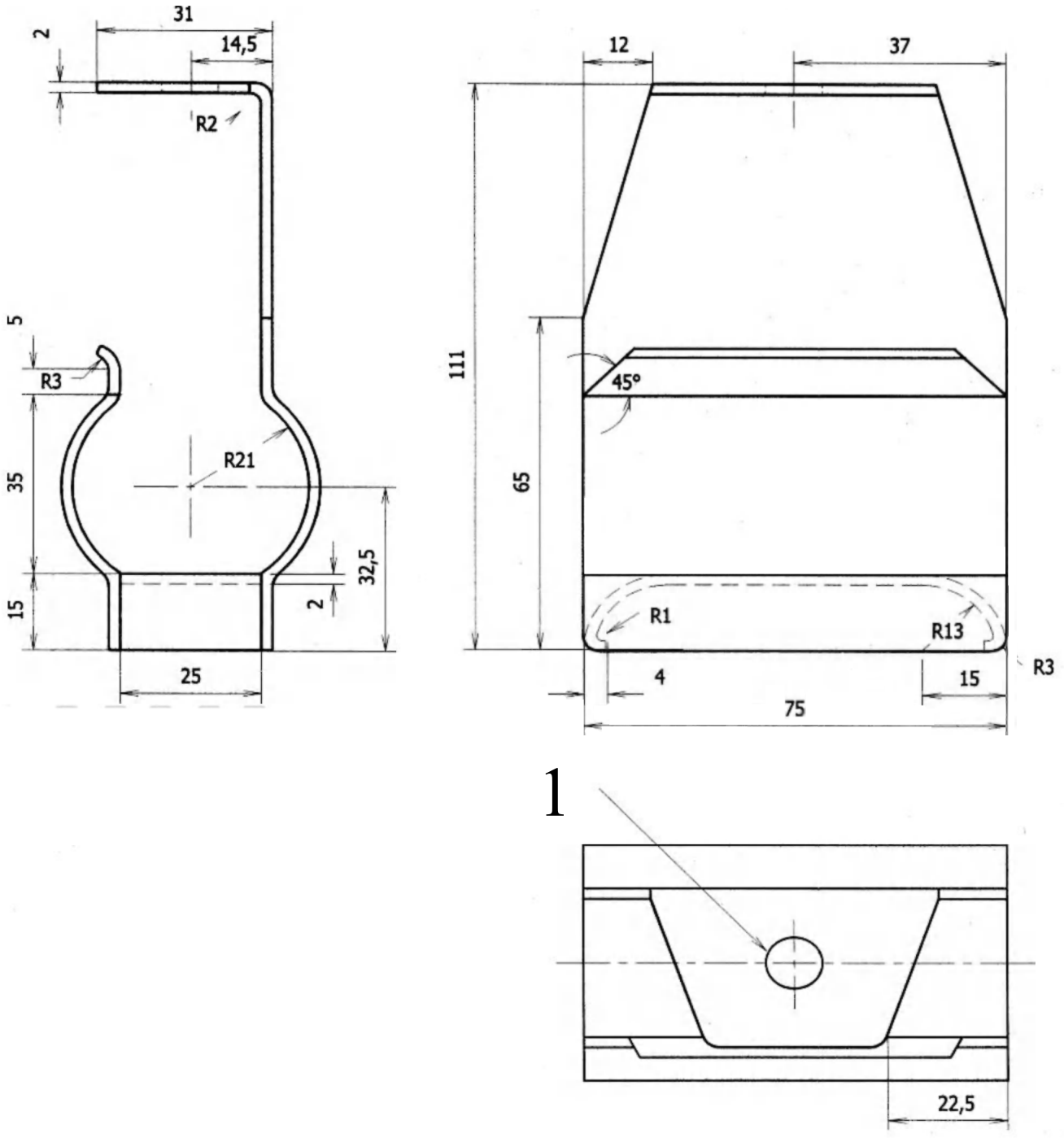
The lifting and lowering movements are carried out by a mechanism which allows to control of the top and bottom turning points.

The equipment is constructed so that the lifting and lowering speed of the bag is (0,65 ± 0,05) m/*s*. The speed shall to be reached is less than 20 mm and shall be constant all throughout both the lifting and lowering procedures, with a smooth movement at the top turning point.

The speed of the lifting mechanism shall be constant within the speed tolerences irrespective of the loaded weights.

The filled carrier bag is hung using both its handles on the grip of the machine which is formed like a hand (see exam*ple* in Figure 3).

Dimensions in millimeters



Tolerance ± 0,5 mm No sharp edges Symmetric	**Key** 1 Excluded from the standard

Figure 3 — Testing equipment - Grip

A handle stop is required. The handle stop shall be so constructed that it fits perfectly in the grip and keeps the handles tight to the grip wihout damaging them. The handle stop shall prevent the handles from coming loose (see example in Figure 4 and the general view of grip and handle stop Figure 5).

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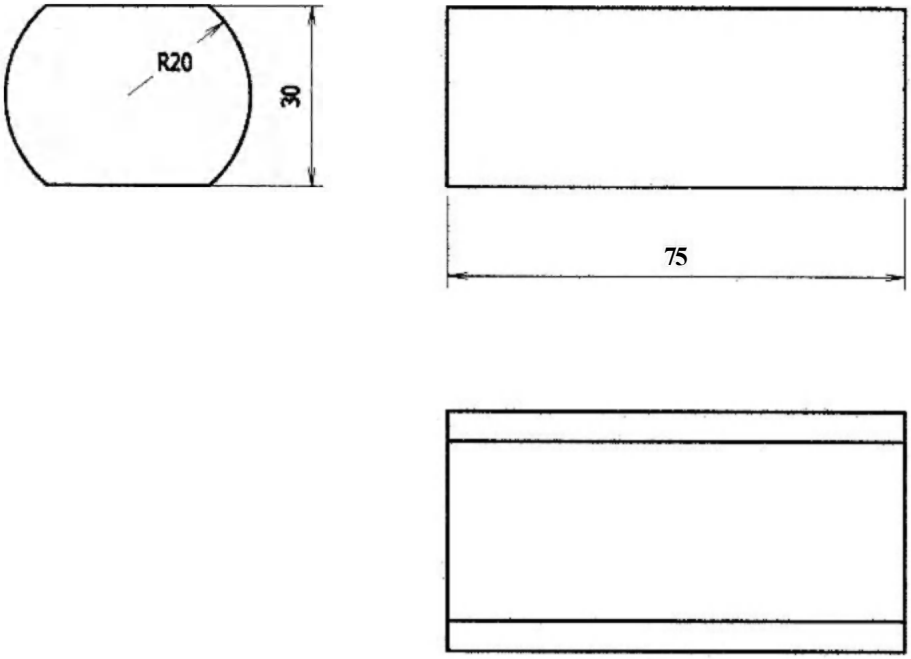
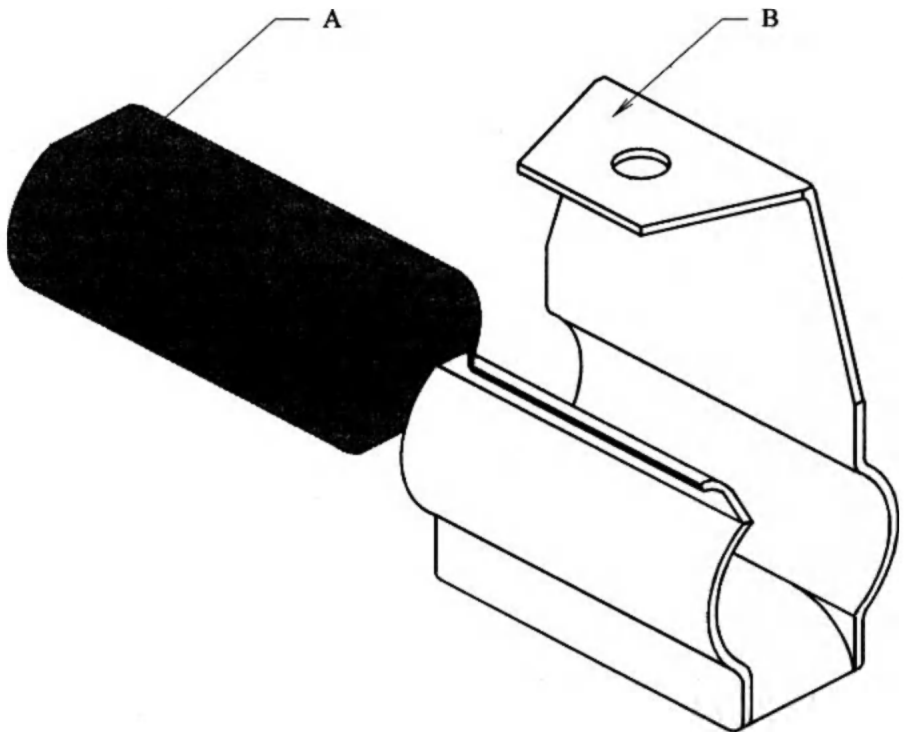


Tolerance ± 0,1 mm
Materal: Plastic , rubber or wood

Figure 4 — testing equipment - Handle stop



Key

A Handle stop

B Grip

Figure 5 — General view of grip and handle stop assembly

The bag is free lifted for 0,5 s ± 0,05 s (ie. approximately 300 mm - 350 mm) and then lowered again.

The number of lifts is counted.

The bottom turning point is controlted by a photocell or an equivalent device, so that the relaxation of the bag is the same whether it is stretched or not.

When the bottom of the bag has touched the bottom plate during the downward move, the machine handle is lowered additionally 50mm ± 5mm .

At the lower turning point the carrier bag is placed and rested on a horizontal rigid smooth surface.

5.5 Procedure for testing

5.5.1 Determination of the volume

For the determination of the volume the following steps are needed:

a) the carrier bag is hung in both is handles so that it is hanging free, eg. on the grp of the testng machine;

b) the bag is filled to the rim w ih plastic granules (see **5 3.1**);

c) the bag is put down and completely released still holding the handles;

d) the bag is lifted again and hung freely as in a) and it is then filled up w ih granules to 2 cm from its upper edge or patch handles;

e) the bag is weighed and its weight is noted;

F) repeat a) to e) for 10 bags, and calculate the average weight;

g) calculate the average volume in liters by dividing the average weight with the bulk specific mass defined in **5.3.1.** The volume is rounded to the nearest full litre so that an average volume of e.g. 15,5 liters is rounded to 16 liters.

5.5.2 Determination of the carrying capacity

The Carrier bag is placed on a balance and filled wih the filling *material given in* **5.3.2**.The bag is filled to the weight calculated in **5.5.1** or, otherw ise, as agreed between supplier and buyer.

The bag is lifted by both its handles from the balance. Then it is hung in its handles on the grip of the testing machine. The handle stop is then pushed into the grip. The lifting bar wih the filled carrier bag is placed in its upper position. The machine is started and the bag is lowered and lifted until it breaks or has been lifted 20 times .

The pass/fail are as follows:

a) holes wih a maximum dimension of 30 mm, while the bag is hanging, are permitted;

b) if holes are bigger than 30mm, or in the case of handle ruptures, the bag is considered as broken.

If only 1 bag out of 20 bags fails, the carrying capaciy is accepted and the test is finished.

If more than 1 bag fails, the load is decreased by 1 kg and another test series of 20 bags is started and so on.

If atleast 4 out of the 5 first tested bags dont break until 20 lifts, the weight is increased by 1 kg and a new test series of 5 new bags is started and so on.

If atleast 2 out of 5 first bags break before they have been lfted 20 times, the test is interrupted, the weight is reduced by 1 kg and a new test series of 5 new bags is started, and so on.

After atleast 4 bags have passed the test wih the last weight, the test is extended until 19 out of 20 bags stand 20 lifts.

5.6 Test report

The test report shall include:

a) name and address of testing laboratory;

b) name and address of responsible supplier;

c) full description of the tested carrier bag type and test date (s);

d) reference to the present European Standard, ie. EN 13950;

e) total number of bags tested and test result for each bag;

f) measured volume of the bags in liters;

g) carrying capaciy in kilograms.

6 Marking

All the information shall be marked in the same font. Bags shall be marked with the following information:

a) suppleir's name, trade mark or identification mark;

b) year and month or week of manufacture;

c) number of this European Standard, ie . EN 13590;

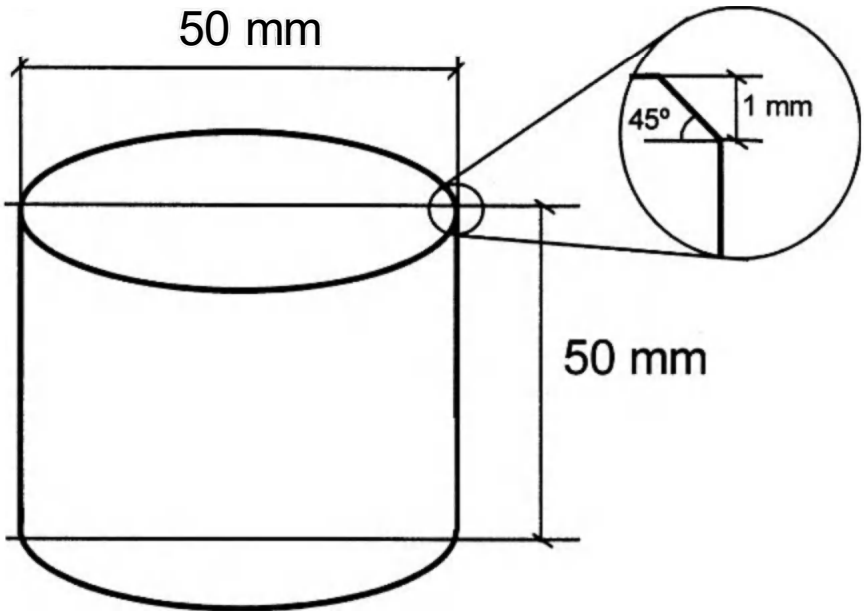
d) the carrying capacity in kilograms (kg) (the carrying capacity shall not be greater than the carrying capacity stated in **5.5.2**)

e) the volume in liters (the volume shall not be greater than the volume calculated in **5.5.1**).

Annex A

(normative)

Filling material



Specifications:

Height	50 mm ± 1 mm
Diameter	50 mm ± 2 mm
Edge	1mm ± 0,5 mm , 45°
Surface	smooth
Materal	HDPE

Figure A.1 — Filling material

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