



SLOVENSKI STANDARD

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Podrobni opis prožnih vmesnih vsebnikov (FIBCs) za nenevarne snovi

Specifications for flexible intermediate bulk containers (FIBCs) for non-dangerous goods

Festlegungen für flexible Großpackmittel (FIBCs) für nicht-gefährliche Güter

Spécifications relatives aux grands récipients vrac souples (GRVS) pour matières non-dangereuses

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ICS:

55.180.99 Drugi standardi v zvezi z Other standards related to
distribucijo blaga s prevozom freight distribution of goods

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Specifications for flexible intermediate bulk containers (FIBCs) for non-dangerous goods

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(GRVS) pour matières non-dangereuses

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This European Standard was approved by CEN on 15 June 2000.

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 Management Centre 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 Management Centre has the same status as the official versions.

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

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat 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of an identical text or by endorsement, at the latest by May 2001, and conflicting national standards shall be withdrawn at the latest by May 2001.

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 Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies materials, construction and design requirements, type test, certification and marking requirements for flexible intermediate bulk containers (FIBCs) intended to contain non-dangerous solid materials in powder, granular or paste form, and designed to be lifted from above by integral or detachable devices.

Guidance is also provided on the selection and safe usage of FIBCs.

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 hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 45001	General criteria for the operation of testing laboratories
EN 45002	General criteria for the assessment of testing laboratories
EN 45003	Calibration and testing laboratory accreditation systems - General requirements for operation and recognition
EN 45011	General criteria for certification bodies operating product certification
ISO 2872	Packaging - Complete, filled transport packages - Compression test
ISO 2874	Packaging - Complete, filled transport packages - Stacking test using compression tester
ISO 5081	Textiles - Woven fabrics - Determination of breaking strength and elongation (Strip method)

3 Terms and definitions

For the purposes of this standard the following definitions apply.

3.1 General

3.1.1

flexible intermediate bulk container (FIBC)

intermediate bulk container having the body made of flexible material such as woven fabric, plastics film or paper, designed to be in contact with the contents, either directly or through an inner liner, and collapsible when empty

3.1.1.1

heavy duty reusable flexible intermediate bulk container

an FIBC designed and intended to be used for a multitude of fillings and discharges, and both factory and field repairable in such a way that the tensile strength across a repair is at least as great as that of the original

3.1.1.2

standard duty reusable flexible intermediate bulk container

an FIBC designed and intended to be used for a limited number of fillings and discharges. An FIBC of this category cannot be reused if damaged, i.e. is not repairable

NOTE The replacement of a removable inner liner is not considered a repair.

3.1.1.3**single-trip flexible intermediate bulk container**

an FIBC designed and intended to be used for one filling only

NOTE An FIBC of this category cannot be reused. Neither replacement of an inner liner nor repair of the FIBC is relevant to this category.

3.1.2**FIBC type**

FIBCs of like design, manufactured using like materials and methods of construction (giving at least equal performance) to the same nominal cross-sectional dimensions

NOTE 1 Within a type, by comparison with samples passing a type test, the circumference may be increased by up to 10 % provided the same geometry is maintained. Where the type has a base discharge spout, smaller diameter discharge spouts of like design may be used. The presence or absence of an inner liner does not constitute a change of type.

3.1.3**safe working load (SWL)**

the maximum load which the FIBC may carry in service, as certified

3.1.4**safety factor (SF)**

the integer quotient between the final test load in the cyclic top lift test and the SWL value rounded down

NOTE Safety factors may be illustrated as follows (See also Annex B.3.3):

	Example 1	Example 2
Designated SWL	500 kg	500 kg
Final load, cyclic test	2400 kgf	2600 kgf
Quotient	4,8	5,2
Integer quotient rounded down	4	5

The results in example 1 above indicate a single trip FIBC which does not meet the requirements of this standard, whilst those in example 2 indicate a single trip FIBC which meets the requirements.

3.1.5**lifting device**

Integral and/or fixed lifting devices which form part of the FIBC and are tested with it

NOTE Detachable lifting devices are regarded as lifting tools

3.2 FIBC parts**3.2.1****walls**

tube of one or more layers, seamless or made out of one or more panels joined together

3.2.2**base**

that part of the FIBC which is connected to or integral with the walls and forms the base of the standing FIBC

3.2.2.1**plain base**

base without an opening

3.2.2.2**base with opening**

flat, conical or in another way formed base with an opening

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3.2.2.3

full open base

extensions to the wall(s), forming the base of the FIBC after closing

3.2.3

top

upper part of the FIBC, excluding handling devices, forming the top of the FIBC after closing

3.2.4

body

the walls and base of the FIBC

3.2.5

inner liner

integral or removable container which fits into the FIBC

3.3 Operating devices

3.3.1 Filling devices

3.3.1.1

filling opening

opening for filling the FIBC

3.3.1.2

filling spout

tube-shaped part at the top for filling the FIBC

3.3.1.3

filling slit

slit-shaped opening at the top for filling the FIBC

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3.3.2 Discharging devices

3.3.2.1

outlet

opening for discharging the FIBC

3.3.2.2

discharging spout

tube-shaped part at the base for discharging the FIBC

3.3.3

closing parts

webbing, cords, straps, etc. which are used to close the filling and discharging devices

3.4 Handling devices

3.4.1

supporting and lifting devices

webbings, loops, ropes, eyes, frames or other devices formed from a continuation of the walls of the FIBC or are integral or detachable, and are used to support or lift the FIBC

3.4.1.1

four point lifting

four lifting devices used simultaneously to lift the FIBC

3.4.1.2

two point lifting

two lifting devices used simultaneously to lift the FIBC

3.4.1.3

one point lifting

one point lifting device, or more lifting devices brought to one point for lifting

3.5

safety and protection devices

valves, ventilation devices and additional parts which protect the filling, discharging or handling devices

3.6

coated and laminated materials

materials having a surface coating or comprising two or more layers laminated together to protect the contents of the filled FIBC or to protect the environment against the effects of leakage of the contents

3.7 Special treatments

3.7.1

stabilization

modification of the FIBC materials to give better resistance against weathering and ageing, e.g. by the addition of an ultra violet (UV) absorber and/or an antioxidant

3.7.2

electrostatic conductivity treatment

treatment for modifying the electrostatic behaviour of the FIBC

3.7.3

insect repellent treatment

treatment for increasing the ability of the FIBC to protect itself and/or its contents against insect attack

3.7.4

flame retardant treatment

treatment to impart flame resistance to the FIBC [SIST EN 1898:2002](https://standards.iteh.ai/catalog/standards/sist/b2652f69-1390-4676-b848-795befe81e48/sist-en-1898-2002)

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4 Materials, construction and design

4.1 Materials

All categories of FIBC shall be manufactured from flexible materials covered by a written specification. The FIBC manufacturer shall have an authorized statement of conformity for each separate batch of materials.

NOTE 1 The properties of the materials may be modified by additives to improve the resistance of the materials against, e.g. degradation by heat and sunlight, and to reduce the effect of static electricity.

All materials shall be tested for breaking force in accordance with the appropriate European Standards, and shall be capable of retaining at least 85 % of the original breaking force after being completely immersed in water for (25 ± 1) h. This measurement shall be taken after firstly, drying the test specimen then, secondly by conditioning it for (60 ± 5) min at a temperature of (23 ± 2) °C and a relative humidity of (50 ± 5) %.

All load bearing materials of the FIBC shall, after being tested in accordance with the test described in annex A, retain at least 50 % of the original values of the breaking force and elongation of the materials.

NOTE 2 Materials should be chosen, and joined together in such a way that recovery is promoted.

4.2 Construction

All stitched seams and joints shall be locked off and/or back sewn or provided with a minimum 20 mm tail. All stitched seam-ends shall be secured. The surfaces to be joined by welding, gluing or heat-sealing shall be clean.

4.3 Design filling height

The designed filling height of the FIBC shall be between 0,5 and 2 times the shortest horizontal dimension of the FIBC.

NOTE For FIBCs with a circular cross-section the shortest horizontal dimension is normally the diameter of the FIBC base. For FIBCs with a rectangular base the shortest horizontal dimension is normally the shortest side.

5 Performance

5.1 Type-testing

All FIBC types shall be subjected to the tests as follows:

- a) cyclic top lift;
- b) compression/stacking test.

At least three specimens of each FIBC type shall be submitted for testing leading to certification. The specimens shall be tested as follows:

- Specimen 1 cyclic top lift test using the FIBC having the shortest vertical dimension;
- Specimen 2 cyclic top lift test using the FIBC having the greatest vertical dimension;
- Specimen 3 compression test using the FIBC having the greatest vertical dimension.

To comply with this standard the three specimens shall withstand the tests.

When the FIBC type has only one fixed vertical dimension, only Specimens 1 and 3 need be submitted, and tested to withstand the tests.

One tested sample shall be durably identified and retained for reference in any later complaint or arbitration.

The tests shall be carried out in a laboratory working under the operational provisions of EN 45001, EN 45002 and EN 45003.

5.2 Preparation of FIBC for test

5.2.1 Filling

For both the top lift and compression/stacking test, the FIBC shall be filled to the level specified in accordance with 4.3 by the manufacturer/supplier with a tolerance of - 0 % and + 5 % of that height. The FIBC shall be filled with either:

- a) a material, e.g. plastics granules, having the following mechanical properties:

- bulk density, 500 kg/m³ to 900 kg/m³;
- mesh size 3 mm to 12 mm;
- angle of repose 30° to 35°.

or :

- b) the actual contents to be carried, when these are known, and where their use will not itself be a hazard

NOTE When option b) is chosen, the FIBC type is certified in relation to that specific product only.

5.2.2 Conditioning

The filled FIBC shall be conditioned before testing at ambient temperature and relative humidity. However, in the event of dispute, testing shall be carried out after conditioning under standard conditions of (23 ± 2) °C and (50 ± 5) % relative humidity.

5.3 Test requirements

5.3.1 Cyclic top lift test(s)

Cyclic top lift test(s) shall be carried out in accordance with annex B and the following criteria shall apply:

- a) no breakage of any lifting devices to the extent that any of the lifting devices ceases to support its load; and
- b) when tested with an inner liner, no protrusion of the latter beyond the outer surface of the FIBC, except through the closure(s), where this is a design feature; and
- c) no loss of contents; and
- d) no deterioration of the body which renders the FIBC unsafe for transport or storage.

NOTE A slight discharge during the test, e.g. from closures or stitch holes, should not be considered to be a failure of the FIBC, provided that no further leakage occurs after the FIBC has been raised clear of the ground.

5.3.2 Compression/stacking test

The compression/stack test shall be carried out in accordance with annex C and the following criteria shall apply:

- a) no loss of contents; and
- b) no deterioration of the body which renders the FIBC unsafe for transport or storage.

NOTE A slight discharge during the test, e.g. from closures or stitch holes, should not be considered to be a failure of the FIBC, provided that no further leakage occurs after the FIBC has been raised clear of the ground.

6 Certification

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An FIBC type which conforms to the requirements of this standard shall be certified by a body working under the operational provisions (such as EN 45011) with a certificate of conformity based on a successful test report(s). EN 45011 may often be used but it is not a requirement of this standard that it has to be used. Where however testing and certification are carried out by the same organization, separate individuals shall be responsible for the tests and for the certification based on them and shall be clearly identified in the documentation.

The certificate shall contain the data shown for the marking in 7(a-i) and 7(k-m), together with:

- a) the name(s) and address(es) of the test station(s), together with the reference(s) and date(s) of the relevant test report(s);
- b) the material used as contents in the cyclic top lift and compression/stacking tests.

A certificate for an FIBC type shall be valid for a period of three years from the date of issue.

An FIBC certified and marked as a single trip FIBC in conformity with this standard shall not be reused.

An FIBC certified and marked as a reusable (heavy or standard duty) FIBC in conformity with this standard shall be reused only with the same type of contents as in the first use.

NOTE Reuse of FIBCs with contents differing from those of the first use is not in accordance with this standard.

7 Marking

All FIBCs shall be durably marked by means of a permanently attached and easily visible and readable label or durably printed on the body so that it is easily visible and read after the FIBC has been filled, with the following data:

- a) name and address of the manufacturer;
- b) manufacturer's reference which shall be unique to any one FIBC type;
- c) name and address of the supplier if required;
- d) safe working load (SWL) in kilograms;
- e) safety factor (SF) i.e. 5:1, 6:1 or 8:1 as appropriate;
- f) reference to this European standard;
- g) class of FIBC, i.e. "heavy duty reusable", "standard duty reusable" or "single trip";
- h) type test certificate number (which shall be unique to any one type) and the month and year in which the type test certificate was issued;
- i) name of the approved laboratory;
- j) date of manufacture of the FIBC, i.e. month and year;
- k) pictograms of the recommended handling methods;
- l) details of any special treatments as defined in 3.7;
- m) where the FIBC is certified in relation to a specific product, the description of that product.

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