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Utgåva 1

Förpackningar – Storsäckar för icke farligt gods (ISO 21898:2004)

Packaging – Flexible intermediate bulk containers (FIBCs) for non-dangerous goods (ISO 21898:2004)

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Emballages - Grands récipients vrac souples (GRVS) pour matières non dangereuses (ISO 21898:2004)

Verpackung - Flexible Großpackmittel (FIBC) für nichtgefährliche Güter (ISO 21898:2004)

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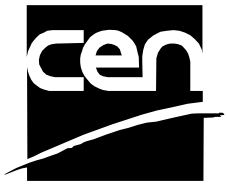

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Foreword

The text of ISO 21898:2004 has been prepared by Technical Committee ISO/TC 122 "Packaging" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 21898:2005 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of an identical text or by endorsement, at the latest by March 2006, and conflicting national standards shall be withdrawn at the latest by March 2006.

This document supersedes EN 1898:2000.

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.

Endorsement notice

The text of ISO 21898:2004 has been approved by CEN as EN ISO 21898:2005 without any modifications.

Packaging — Flexible intermediate bulk containers (FIBCs) for non-dangerous goods

1 Scope

This International 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

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 12048, *Packaging — Complete, filled transport packages — Compression and stacking tests using a compression tester*

ISO 13934-1, *Textiles — Tensile properties of fabrics — Part 1: Determination of maximum force and elongation at maximum force using the strip method*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

3 Terms and definitions

For the purposes of this document, the following terms and 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

3.1.2
heavy-duty reusable flexible intermediate bulk container
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

3.1.3
standard-duty reusable flexible intermediate bulk container
FIBC designed and intended to be used for a limited number of fillings and discharges

NOTE 1 An FIBC of this category cannot be reused if damaged, i.e. it is not repairable.

NOTE 2 The replacement of a removable inner liner is not considered a repair.

3.1.4
single-trip flexible intermediate bulk container
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.

3.1.5
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, the circumference may be increased by up to 10 % by comparison with samples passing a type test, provided the same geometry is maintained. Where the type has a base discharge spout, smaller diameter discharge spouts of like design may be used.

NOTE 2 The presence or absence of an inner liner does not constitute a change of type.

3.1.6
safe working load
SWL
maximum load which the FIBC may carry in service, as certified

3.1.7
safety factor
SF
integer quotient between the final test load in the cyclic top lift test and the SWL value rounded down

NOTE 1 Safety factors may be illustrated as follows (see also B.3.3):

	Example 1	**Example 2**
Designated SWL	500 kg	500 kg
Final load, cyclic test	2 400 kgf	2 600 kgf
Quotient	4,8	5,2
Integer quotient, rounded down	4	5

NOTE 2 The results in Example 1 above indicate a single-trip FIBC which does not meet the requirements of this International Standard, whilst those in Example 2 indicate a single-trip FIBC which meets the requirements.

3.1.8
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

3.2.3
plain base
base without an opening

3.2.4
base with opening
flat, conical or in another way formed base with an opening

3.2.5
full open base
extensions to the wall(s), forming the base of the FIBC after closing

3.2.6
top
upper part of the FIBC, excluding handling devices, forming the top of the FIBC after closing

3.2.7
body
walls and base of the FIBC

3.2.8
inner liner
integral or removable container which fits into the FIBC

3.3 Operating devices

3.3.1
filling opening
opening for filling the FIBC

3.3.2
filling spout
tube-shaped part at the top for filling the FIBC

3.3.3
filling slit
slit-shaped opening at the top for filling the FIBC

3.3.4
outlet
opening for discharging the FIBC

3.3.5
discharging spout
tube-shaped part at the base for discharging the FIBC

3.3.6
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, which are integral or detachable, and are used to support or lift the FIBC

3.4.2
four-point lifting
four lifting devices used simultaneously to lift the FIBC

3.4.3
two-point lifting
two lifting devices used simultaneously to lift the FIBC

3.4.4
one-point lifting
one lifting device, or one 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

EXAMPLE The addition of an ultraviolet (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
f**lame-retardant treatment**
treatment to impart flame resistance to the FIBC

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.

The properties of the materials may be modified by additives to improve the resistance of the materials against, for example, 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 International 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 first 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.

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, glueing 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 following tests:

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 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 International Standard the three specimens shall all 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.

Tests shall be carried out at a testing facility capable of meeting the operational provisions of ISO/IEC 17025.

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 $^{+5}_{0}$ % 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/m^3 to 900 kg/m^3,

— 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.