
Embalaža - Transportna embalaža za nevarno blago - Togi vsebniki IBC in sestavljeni vsebniki IBC z notranjo plastično posodo - Preskušanje združljivosti (ISO 23667:2007)

Packaging - Transport packaging for dangerous goods - Rigid plastics and plastics composite IBCs - Compatibility testing (ISO 23667:2007)

Verpackung - Verpackungen zur Beförderung gefährlicher Güter - Starre Kunststoff-IBC und Kombinations-IBC mit Kunststoffinnenbehälter - Verträglichkeitsprüfung (ISO 23667:2007)

Emballage - Emballages d'expédition de marchandises dangereuses - Grands récipients en vrac en plastique rigide et en plastique composite - Essais de compatibilité (ISO 23667:2007)

Ta slovenski standard je istoveten z: EN ISO 23667:2007

ICS:

| | | |
|-----------|---|--|
| 13.300 | Varstvo pred nevarnimi izdelki | Protection against dangerous goods |
| 55.180.99 | Drugi standardi v zvezi z distribucijo blaga s prevozom | Other standards related to freight distribution of goods |

SIST EN ISO 23667:2008**en,fr,de**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 23667:2008](#)

<https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 23667

July 2007

ICS 55.020; 13.300

English Version

**Packaging - Transport packaging for dangerous goods - Rigid
plastics and plastics composite IBCs - Compatibility testing (ISO
23667:2007)**

Emballages - Emballages de transport pour marchandises
dangereuses - Grands récipients pour vrac en plastique
rigide et en plastique composite - Essais de compatibilité
(ISO 23667:2007)

Verpackung - Verpackungen zur Beförderung gefährlicher
Güter - Starre Kunststoff-IBC und Kombinations-IBC mit
Kunststoffinnenbehälter - Verträglichkeitsprüfung (ISO
23667:2007)

This European Standard was approved by CEN on 20 June 2007.

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

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

EN ISO 23667:2007 (E)**Foreword**

This document (EN ISO 23667:2007) has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR, in collaboration with Technical Committee ISO/TC 122 "Packaging".

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 January 2008, and conflicting national standards shall be withdrawn at the latest by January 2008.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 23667:2008](https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008)

<https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008>

INTERNATIONAL
STANDARD

ISO
23667

First edition
2007-07-15

**Packaging — Transport packaging for
dangerous goods — Rigid plastics and
plastics composite IBCs — Compatibility
testing**

*Emballages — Emballages de transport pour marchandises
dangereuses — Grands récipients pour vrac en plastique rigide et en
plastique composite — Essais de compatibilité*

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN ISO 23667:2008

<https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008>



Reference number
ISO 23667:2007(E)

© ISO 2007

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 23667:2008

<https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008>

**COPYRIGHT PROTECTED DOCUMENT**

© ISO 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

Contents

Page

| | |
|--|-----------|
| Foreword | iv |
| Introduction | v |
| 1 Scope | 1 |
| 2 Normative references | 1 |
| 3 Terms and definitions | 2 |
| 4 Test requirements | 2 |
| 5 Selection and preparation of test IBCs | 4 |
| 6 Facilities for testing | 6 |
| 7 Conditioning procedures | 7 |
| Annex A (normative) Standard liquids and applicability to polyethylene types | 9 |
| Annex B (normative) Small scale laboratory tests to assess packaged substances against standard liquids | 12 |
| Annex C (informative) Assimilation of packaged substance to standard liquids | 31 |
| Bibliography | 82 |

PDF STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 23667:2008](https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008)

<https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008>

ISO 23667:2007(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 23667 was prepared by the European Committee for Standardization (CEN) Technical Committee CEN/TC 261, *Packaging*, in collaboration with ISO Technical Committee TC 122, *Packaging*, Subcommittee SC 3, *Performance requirements and tests for means of packaging, packages and unit loads (as required by ISO/TC 122)*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

SIST EN ISO 23667:2008
<https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008>

Introduction

This International Standard was developed to provide requirements and test procedures to meet the compatibility provisions for plastics Intermediate Bulk Containers (IBCs) to contain liquids as set out in:

- the *European Agreement concerning the International Carriage of Dangerous Goods by Road* (ADR) (covering most of Europe) [2]; and
- the *Regulations concerning the International Carriage of Dangerous Goods by Rail* (RID) (covering most of Europe, parts of North Africa and the Middle East) [5].

This procedure is an alternative option to that set out in the *UN Recommendations on the Transport of Dangerous Goods* [1].

Plastics IBC material can be attacked by the chemical contents of the package. Such effects are caused by different mechanisms such as environmental stress cracking (ESC), chemical degradation and swelling.

The UN recommendations and the associated modal regulations require that all IBCs shall be assessed for compatibility with the substances which they are to contain. The UN text makes special reference to plastics IBCs for liquids. The procedure therein contains details of testing for six months at ambient temperature with the liquid to be carried. RID/ADR permits as an alternative the use of standard liquids to which this document refers.

The UN recommendations are given legal entity not only to ADR and RID, but also to

- the *International Maritime Dangerous Goods Code* (IMDG Code) (worldwide) [4].

These modal rules do not refer to the standard liquid tests, but they may still be acceptable as the UN provisions do not make the six month test a mandatory requirement.

The application of this International Standard will need to take account of the requirements of these international agreements and the relevant national regulations [6], [7] for domestic transport of dangerous goods.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 23667:2008](#)

<https://standards.iteh.ai/catalog/standards/sist/ee02e160-99bb-4d5f-98d4-13e5619578f1/sist-en-iso-23667-2008>

Packaging — Transport packaging for dangerous goods — Rigid plastics and plastics composite IBCs — Compatibility testing

WARNING — The use of this International Standard may involve hazardous materials and equipment. This International Standard does not purport to address all of the safety problems associated with its use. It is the responsibility of the user of this International Standard to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

1 Scope

This International Standard specifies the requirements and test methods for compatibility testing of polyethylene-based plastics Intermediate Bulk Containers (IBCs) and composite IBCs with plastics inners containing liquids. The testing involves storage with the packaged substance, or with a standard liquid as defined in Annex A. Annex B describes small scale laboratory tests, which may be used to determine the assimilation of those products to be carried with the standard liquids.

This International Standard should be used in conjunction with one or more of the international regulations set out in the Bibliography.

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 291, *Plastics — Standard atmospheres for conditioning and testing*

ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics*

ISO 1133, *Plastics — Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics*

ISO 1183-1, *Plastics — Methods for determining the density of non-cellular plastics — Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 1628-3, *Plastics — Determination of the viscosity of polymers in dilute solution using capillary viscometers — Part 3: Polyethylenes and polypropylenes*

ISO 1872-2, *Plastics — Polyethylene (PE) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

ISO 2818, *Plastics — Preparation of test specimens by machining*

ISO 11403-3, *Plastics — Acquisition and presentation of comparable multipoint data — Part 3: Environmental influences on properties*

ISO 23667:2007(E)

ISO 11542-2:1998, *Plastics — Ultra-high-molecular-weight polyethylene (PE-UHMW) moulding and extrusion materials — Part 2: Preparation of test specimens and determination of properties*

ISO 16467:2003, *Packaging — Transport packages for dangerous goods — Test methods for IBCs*

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

ISO 16770, *Plastics — Determination of environmental stress cracking (ESC) of polyethylene — Full- notch creep test (FNCT)*

3 Terms and definitions

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

3.1 competent authority
any national regulatory body or authority designated or otherwise recognized as such for any purpose in connection with the regulations specified in the Bibliography

3.2 plastics IBCs
rigid plastics intermediate bulk containers and composite intermediate bulk containers with inner plastics receptacles (where “plastics” refers to certain types of polyethylene)

NOTE Certain types of polyethylene are listed in A.3.

3.3 packaged substance (chemical product)
dangerous liquid with which the IBC is to be filled for transport

NOTE IBCs used for solid packaged substances, which can become liquid at temperatures encountered during transport, should also meet the requirements of IBCs for liquids.

3.4 standard liquids
defined liquids that are representative in their effect for a specific kind of interaction between a packaged substance and the plastics IBC

NOTE A full description of the standard liquids can be found in A.2.

4 Test requirements**4.1 General**

Plastics IBCs selected in accordance with Clause 5 shall be conditioned with the packaged substance or a standard liquid with which it is to be assimilated. Annex C contains a list of substances assimilated to standard liquids.

For other chemicals not listed in Annex C, small scale laboratory tests (see Annex B) shall be used to prove assimilation with standard liquids. The standard liquid chosen shall be at least as aggressive as the substance to be transported. Where the packaged substance to be filled cannot be assimilated with one of the standard liquids, the packaged substance itself shall be used and its specification recorded. In the event that the effect is more aggressive than that of the standard liquids, the six month procedure shall be followed, as given in 7.1, or alternatively, and with the exception of nitric acid > 55 %, the accelerated procedure, as given in 7.2.

NOTE When the standard liquid is water, proof of chemical compatibility is not required.

4.2 Conditioning

Plastics IBCs shall be conditioned in accordance with Clause 7 of this International Standard.

4.3 Post-conditioning inspection

At the end of the conditioning period, the IBCs shall be inspected for leakage. Where no leakage is apparent, testing in accordance with Clause 7 of ISO 16467:2003 shall commence within 21 days of the end of the conditioning period (see 7.3).

4.4 Applicability

The tests referred to in 4.5 to 4.10 below may not be applicable to all types of IBCs. See Table 1.

The following tests are applicable, as shown in the sequence of testing required.

Table 1 — Applicability of tests

| Test | Rigid plastics IBC | Composite IBC with plastics inner receptacle |
|--|---------------------------|--|
| 4.5 Bottom lift test | 1st ^a | 1st ^a |
| 4.6 Top lift test | 2nd ^a | 2nd ^a |
| 4.7 Stacking test — 28 days at 40 °C containing standard liquid | 3rd ^c | 3rd ^{b, c} |
| 4.7 Stacking test — 24 h at ambient temperature (minimum 15 °C — see 7.1) | not required ^f | 3rd ^{c, e, f} |
| 4.8 Leakproofness test | 4th | 4th |
| 4.9 Hydraulic pressure test | 5th | 5th |
| 4.10 Drop test at –18 °C | 6th | 6th ^d |

NOTE When mechanical tests, in accordance with ISO 16467, have been successfully carried out, it is not necessary to carry out tests 4.5 (Bottom lift test), 4.6 (Top lift test) and 4.7 (Stacking test) for composite IBCs with plastics inner receptacle.

^a Where IBCs are designed for this method of handling.
^b Not required where composite IBC has a non-plastics outer component that supports the stacking load.
^c Where IBCs are designed to be stacked during transport.
^d A second sample may be used for the drop test.
^e Required where composite IBC has a non-plastics outer component that supports the stacking load.
^f A second sample may be used for the stacking test.

4.5 Bottom lift test

When tested in accordance with 7.1 of ISO 16467:2003, there shall be no permanent deformation which renders the IBC, including base pallet, if any, unsafe for transport and no loss of contents.

4.6 Top lift test

When tested in accordance with 7.2 of ISO 16467:2003, there shall be no permanent deformation which renders the IBC including the base pallet, if any, unsafe for transport and no loss of contents.

ISO 23667:2007(E)**4.7 Stacking test**

When tested in accordance with 7.4 of ISO 16467:2003, there shall be no permanent deformation which renders the IBC, including the base pallet, if any, unsafe for transport and no loss of contents.

4.8 Leakproofness test

When tested in accordance with 7.5 of ISO 16467:2003, there shall be no leakage of air.

4.9 Hydraulic pressure test

When tested in accordance with 7.6 of ISO 16467:2003, there shall be no permanent deformation which renders the IBC unsafe for transport and leakage of liquid.

4.10 Drop test

When tested in accordance with 7.7 of ISO 16467:2003, there shall be no loss of contents. A slight discharge from a closure on impact shall not be considered as a failure of the IBC provided that no further leakage occurs.

4.11 Equivalent testing

The test methods described in this International Standard shall be considered to be the reference test methods.

Alternative methods may be used to demonstrate compliance with relevant regulations provided that:

- their equivalency to the reference method can be demonstrated;
- their use is recorded in the test report;
- prior approval is obtained from the competent authority.

4.12 Test report

All IBC tests in conformity with this International Standard shall be the subject of a test report and specification check in accordance with Annex C of ISO 16467:2003. It shall be possible to specifically identify the IBC relative to each test report, either by the retention of the uniquely referenced IBCs, or by inclusion of sufficient photographs and/or drawings with unique references to enable identification of the IBC and all its components.

5 Selection and preparation of test IBCs**5.1 Selection of IBCs**

One or two IBCs of each design type, for each filling substance to be tested, shall be selected at random from a production batch and submitted for testing.

IBCs shall be

- a) at least 48 h old,
- b) marked with a test reference number which shall also be entered on the test record and later used on the test report,

- c) individually weighed to establish the tare or the filled mass,

NOTE The form of such weighing may be varied to fit in with whether the IBCs have been supplied full or empty to the test station. Where the masses of individual empty IBCs are recorded, it is necessary to record only a typical filled mass (or vice versa).

- d) examined for damage, etc., which might invalidate the tests.

The tests set out below should be applied to every design type of IBC, by polymer type and grade.

NOTE For selective testing, see ISO 16467:2003, Annex D.

5.2 Information to be provided with IBCs

Each IBC type shall be accompanied by specification(s) for that design type (in the appropriate format set out in Annex C of ISO 16467:2003) and by the following additional information as relevant.

The IBC user (with the assistance, where appropriate, of the IBC manufacturer and the test laboratory) shall identify the packaged substance. In the first instance, this process shall consist of identifying the plastics material concerned and its possible interactions, such as swelling, environmental stress cracking (ESC) and molecular degradation.

The specification forms for plastics IBCs should identify the material by polymer type and grade.

NOTE Where tests are carried out using the packaged substance, the test report may be applicable for other substances having equivalent or lesser chemical effects.

5.3 Filling of IBCs prior to testing

5.3.1 General

IBCs shall be filled for testing as follows.

- a) For bottom and top lift tests, IBCs shall be prepared in accordance with 7.1 and 7.2 of ISO 16467:2003.
- b) For the stacking test, IBCs shall be prepared in accordance with 7.4 of ISO 16467:2003.
- c) For the leakproofness and hydraulic pressure tests, IBCs shall be prepared in accordance with 7.5 and 7.6 of ISO 16467:2003.
- d) For the drop test, IBCs shall be filled in accordance with 5.3.3.1 of ISO 16467:2003.

5.3.2 Filling of IBC prior to testing

Filling of IBCs shall be carried out in accordance with the following:

The IBC shall be filled to not less than 98 % of the brimful capacity. The brimful (overflow) capacity is determined by weighing the empty IBC including closures, filling the IBC with water until the water just overflows, fitting the closure and then weighing the IBC full. Any surplus water is mopped up. No steps shall be taken, e.g. by tilting or tapping the IBC, to enable water to penetrate into a hollow lifting feature or other design feature above the closure.

The following formula expresses the brimful capacity:

$$b = \frac{W - m}{d} \quad (1)$$