



SLOVENSKI STANDARD

SIST EN ISO 16495:2022

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Nadomešča:

SIST EN ISO 16495:2014

Embalaža - Transportna embalaža za nevarno blago - Preskusne metode (ISO 16495:2022)

Packaging - Transport packaging for dangerous goods - Test methods (ISO 16495:2022)

Verpackung - Verpackungen zur Beförderung gefährlicher Güter - Prüfverfahren (ISO 16495:2022)

Emballages - Emballages de transport pour marchandises dangereuses - Méthodes d'essai (ISO 16495:2022)

Ta slovenski standard je istoveten z: EN ISO 16495:2022

ICS:

13.300	Varstvo pred nevarnimi izdelki	Protection against dangerous goods
55.020	Pakiranje in distribucija blaga na splošno	Packaging and distribution of goods in general

SIST EN ISO 16495:2022

en,fr,de

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 16495

June 2022

ICS 13.300; 55.020

Supersedes EN ISO 16495:2013

English Version

**Packaging - Transport packaging for dangerous goods -
Test methods (ISO 16495:2022)**

Emballages - Emballages de transport pour
marchandises dangereuses - Méthodes d'essai (ISO
16495:2022)

Verpackung - Verpackungen zur Beförderung
gefährlicher Güter - Prüfverfahren (ISO 16495:2022)

This European Standard was approved by CEN on 25 May 2022.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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European foreword

This document (EN ISO 16495:2022) has been prepared by Technical Committee ISO/TC 122 "Packaging" in collaboration with 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of an identical text or by endorsement, at the latest by December 2022, and conflicting national standards shall be withdrawn at the latest by December 2022.

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.

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Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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Endorsement notice

The text of ISO 16495:2022 has been approved by CEN as EN ISO 16495:2022 without any modification.

INTERNATIONAL STANDARD

**ISO
16495**

Second edition
2022-05

Packaging — Transport packaging for dangerous goods — Test methods

*Emballages — Emballages de transport pour marchandises
dangereuses — Méthodes d'essai*

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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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/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 collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 261, *Packaging*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 16495:2013), which has been technically revised.

The main changes are as follows:

- changes to [Table B.1](#), [Table B.2](#), [Table B.3](#), [Table C.1](#), [Table D.1](#), [Table D.2](#) and [Table D.3](#);
- additional requirements in [Annex H](#), “H.2 Preparation” added;
- deletion of Table H.1;
- editorial improvements.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

This document was developed to provide requirements and test procedures to meet the multi-modal United Nations Recommendations on the Transport of Dangerous Goods Model Regulations referred to as “UN Recommendations” throughout this document, and successful passing of the tests may lead to the allocation of an appropriate UN packaging mark. The UN Recommendations have been developed by the United Nations Subcommittee of Experts on the Transport of Dangerous Goods as a ‘model regulation’ in the light of technical progress, the advent of new substances and materials, the exigencies of modern transport systems and, above all, the need to ensure the safety of people, property and the environment. Amongst other aspects, the UN Recommendations cover principles of classification and definition of classes, listing of the principal dangerous goods, general packing requirements, testing procedures, marking, labelling or placarding, and shipping documents. In addition, there are special recommendations related to particular classes of goods.

The UN Recommendations are given legal entity by the provisions of a series of international modal agreements and national legislation for the transport of dangerous goods. The international agreements include the following:

- The European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR) (covering most of Europe)^[4];
- Regulations concerning the International Carriage of Dangerous Goods by Rail (RID) (covering most of Europe, parts of North Africa and the Middle East)^[5];
- The International Maritime Dangerous Goods Code (IMDG Code) (worldwide)^[6];
- The International Civil Aviation Organization’s Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO TIs) (worldwide)^[7].

Application of this document presupposes awareness of the requirements of these international agreements and the relevant national regulations for domestic transport of dangerous goods.

It is important to note that there will be certain modal differences from the UN Recommendations and that the schedule for revision of the recommendations and modal provisions may lead to temporary inconsistencies with this document.

It is noted that success in the tests and the allocation of an official UN mark do not on their own authorize the use of a packaging for any dangerous goods, which are subject to the packing instructions published in the various modal regulations.

This document is based on Revision 21 of the UN Recommendations.

Packaging — Transport packaging for dangerous goods — Test methods

1 Scope

This document specifies the information needed for the design type testing of packaging, intermediate bulk containers (IBCs) and large packaging intended for use in the transport of dangerous goods.

NOTE 1 This document can be used in conjunction with one or more of the international regulations set out in the Bibliography.

NOTE 2 The term “packaging” includes packaging for Class 6.2 infectious substances according to the United Nations.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 2206, *Packaging — Complete, filled transport packages — Identification of parts when testing*

ISO 2248:1985, *Packaging — Complete, filled transport packages — Vertical impact test by dropping*

ISO 2875:2000, *Packaging — Complete, filled transport packages and unit loads — Water-spray test*

ISO/IEC 17025:2017, *General requirements for the competence of testing and calibration laboratories*

United Nations Recommendations on the Transport of Dangerous Goods — Model Regulations

3 Terms and definitions

For the purposes of this document, the terms and definitions given in the UN Recommendations, Chapter 1.2.1, and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1

brimful capacity

volume of water in litres held by the packaging, intermediate bulk container (IBC), inner packaging of a combination packaging and/or large packaging, when filled through the designed filling orifice to the point of overflowing in its normal position of filling, and considered for testing purposes as maximum capacity

3.2

nominal capacity

capacity in litres which, by convention, is used to represent a class of packaging of a similar *brimful capacity* (3.1)

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3.3

single packaging

means of packaging that does not require an inner packaging to be capable of performing its containment function and it includes composite packaging

4 Selection and preparation of packaging, IBCs and large packaging for testing**4.1 General**

The type of contents (liquid, viscous or solid) is crucial for the selection and preparation of the packaging, IBCs and large packaging for testing

NOTE Guidance on the determination of the type of contents is given in [Annex E](#).

4.2 Selection of packaging, IBCs and large packaging

Sufficient numbers of packaging, IBCs and large packaging per design type shall be:

- a) selected for testing;
- b) examined for damage which might invalidate the tests, in which event the packaging, IBCs and large packaging shall be replaced;
- c) marked with a test reference which shall also be entered on the test record and later used on the test report;
- d) individually weighed to establish the tare or filled gross mass.

The different parts of the packaging shall be identified in accordance with ISO 2206.

NOTE 1 The form of such weighing can vary according to whether the packaging, IBCs and large packaging have been supplied full or empty to the test station. Where the masses of individual empty packaging, IBCs and large packaging are recorded, it is sufficient to record only a typical filled gross mass (or vice versa).

NOTE 2 Under some circumstances it can be desirable to have a range of packaging, IBCs and large packaging tested.

Examples include:

- different sizes but of the same construction;
- a variety of closures;
- a range of solid contents for use.

In such situations selective testing procedure can be used to avoid testing of every possible permutation. The competent authority can allow this procedure after consultation.

4.3 Information to be provided with packaging, IBCs and large packaging**4.3.1 General**

Each packaging, IBCs and large packaging type shall be accompanied by a specification for that design type containing the data set outlined in [Annexes B, C or D](#) and by the following additional information contained in [4.3.2](#) to [4.3.6](#) as appropriate.

4.3.2 Test contents – using water and non-dangerous substances

Where the tests are to be carried out using water or other non-dangerous substances, a statement of the packing group for which the packaging is to be tested shall be provided, together with data, enabling

appropriate selection of inert test contents. For liquids, such data shall include the required maximum relative density for the tests together with data on, for instance, the internal pressure test required. For solids, such data shall include mass, grain size and any other relevant characteristics, for example, bulk density or angle of repose, to clearly show equivalence of physical characteristics.

4.3.3 Test contents – using the dangerous substance

Where the tests are to be carried out using the dangerous substance(s) to be transported, a statement of their packing group and their physical characteristics shall be provided.

NOTE This information can be obtained from the Safety Data Sheet for the dangerous substance(s), available from sources such as the manufacturer of the dangerous substance(s).

Liquids shall be defined by their relative density together with viscosity and method of determination. Solids shall be defined by their mass and grain size and any other relevant characteristic, for example, bulk density and angle of repose, to ensure physical characteristics are sufficiently identified and included. This data shall be recorded in the test report (see [Annex A](#)).

Where the tests are carried out using the actual substance to be transported then they shall be applicable for other substances having the same or similar characteristics.

4.3.4 Vapour pressure

For liquids, the vapour pressure (at a given temperature) of the substance to be carried or the hydraulic pressure to be achieved during the tests shall be provided.

4.3.5 Test contents – using articles

Where the packaging and large packaging is intended for the transport of (an) article(s), a statement of the packing group, an appropriate description and drawing(s) of the article(s) and or photographs and details of the way in which dummy articles were filled for the purpose of testing shall be provided.

4.3.6 Closing instructions

Any special filling or closing instructions including, where relevant, the closure torque, or taping patterns shall be provided.

4.3.7 Handling characteristics of IBCs and large packaging

Each IBC and large packaging design shall be accompanied by a statement of its mechanical handling characteristics. This shall relate to bottom lift, top lift or both, as applicable, and number of identical items to be stacked during transport.

4.4 Selection of contents and filling of packaging, IBCs and large packaging prior to testing

4.4.1 General

Single packaging, IBCs, the inner packaging of combination packaging and large packaging shall be filled for drop and stacking tests to not less than:

- 98 % of brimful capacity for liquids, and
- 95 % of brimful capacity for solids.

NOTE There can be exceptions, some flexible packaging (see [4.4.4](#)) and some packaging designed to be transported part full (see [4.4.5](#)).