



SLOVENSKI STANDARD

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Tanks for transport of dangerous goods - Testing, inspection and marking of metallic tanks

Tanks für die Beförderung gefährlicher Güter - Prüfung, Inspektion und Kennzeichnung von Metalltanks

Citernes destinées au transport de matières dangereuses - Epreuve, contrôle et marquage des citernes métalliques

Ta slovenski standard je istoveten z: **EN 12972:2015**

ICS:

13.300	Varstvo pred nevarnimi izdelki	Protection against dangerous goods
23.020.20	Posode in vsebniki, montirani na vozila	Vessels and containers mounted on vehicles

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EUROPEAN STANDARD

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Tanks for transport of dangerous goods - Testing, inspection and marking of metallic tanks

Citernes destinées au transport des matières dangereuses -
Épreuve, contrôle et marquage des citernes métalliques

Tanks für die Beförderung gefährlicher Güter - Prüfung,
Inspektion und Kennzeichnung von Metalltanks

This European Standard was approved by CEN on 5 December 2014.

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 12972:2015) has been prepared by Technical Committee CEN/TC 296 "Tanks for transport of dangerous goods", 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of an identical text or by endorsement, at the latest by August 2015 and conflicting national standards shall be withdrawn at the latest by August 2015.

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

This document supersedes EN 12972:2007.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

Compared with EN 12972:2007 the following fundamental changes have been made:

- a) alignment of the standard with RID 2013 [1] and ADR 2013 [2]; and
- b) updating of the normative references.

The document has been submitted for reference into the RID and/or in the technical annexes of the ADR.

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, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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Introduction

The types and frequencies of the inspections and tests as well as the responsibilities are given by the relevant regulations concerning the transport of dangerous goods.

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1 Scope

This European Standard specifies testing, inspection and marking for the type approval, initial inspection, periodic inspection, intermediate inspection and exceptional check of metallic tanks (shell and equipment) of fixed tanks (tank vehicles), demountable tanks, rail tank wagons, portable tanks and tank containers for the transport of dangerous goods.

This European Standard is not applicable to battery-vehicles and battery-wagons comprising cylinders, tubes, pressure drums, bundles of cylinders and multiple element gas containers (MEGCs), independent of whether the elements are receptacles or tanks.

It is essential that the requirements of the applicable regulations for the transport of dangerous goods prevail in all cases over those of this standard.

2 Normative references

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

EN 590, *Automotive fuels - Diesel - Requirements and test methods*

EN 837-1, *Pressure gauges - Part 1: Bourdon tube pressure gauges - Dimensions, metrology, requirements and testing*

EN 837-2, *Pressure gauges - Part 2: Selection and installation recommendations for pressure gauges*

EN 837-3, *Pressure gauges - Part 3: Diaphragm and capsule pressure gauges - Dimensions, metrology, requirements and testing*

EN 12079-1, *Offshore containers and associated lifting sets - Part 1: Offshore container - Design, manufacture and marking*

EN 12266-1:2012, *Industrial valves - Testing of metallic valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*

EN ISO 3834-2, *Quality requirements for fusion welding of metallic materials - Part 2: Comprehensive quality requirements (ISO 3834-2)*

EN ISO 9606-1, *Qualification testing of welders - Fusion welding - Part 1: Steels (ISO 9606-1)*

EN ISO 9606-2, *Qualification test of welders - Fusion welding - Part 2: Aluminium and aluminium alloys (ISO 9606-2)*

EN ISO 9606-3, *Approval testing of welders - Fusion welding - Part 3: Copper and copper alloys (ISO 9606-3)*

EN ISO 9606-4, *Approval testing of welders - Fusion welding - Part 4: Nickel and nickel alloys (ISO 9606-4)*

EN ISO 14731, *Welding coordination - Tasks and responsibilities (ISO 14731)*

EN ISO 14732, *Welding personnel - Qualification testing of welding operators and weld setters for mechanized and automatic welding of metallic materials (ISO 14732)*

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials - General rules (ISO 15607)*

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EN ISO 15609-1, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 1: Arc welding (ISO 15609-1)*

EN ISO 15614-1, *Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1)*

EN ISO 15614-2, *Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 2: Arc welding of aluminium and its alloys (ISO 15614-2)*

IMO MSC/Circ. 860, *Guidelines for the approval of offshore containers handled in open seas*

UN Manual of Tests and Criteria, Part IV

3 Terms and definitions

The definitions of terms used in this document are taken as those given by the relevant regulations concerning the transport of dangerous goods unless otherwise stated.

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

3.1**capacity of shell or shell compartment for tanks**

the total inner volume of the shell or shell compartment expressed in litres or cubic metres. When it is not possible to completely fill the shell or the shell compartment because of its shape or construction, this reduced capacity shall be used for the determination of the degree of filling and for the marking of the tank

3.2**expert**

individual or body approved by the competent authority to perform designated inspections and tests

Note 1 to entry: According to RID/ADR testing, inspection and certification duties are allocated to either the competent authority or to inspection bodies or experts approved by the competent authority. RID and ADR include detailed requirements on the qualification, obligations, accreditation and approval of these inspection bodies.

3.3**inspection body**

body approved by the competent authority to perform designated inspection and tests

3.4**protective lining or coating**

lining or coating protecting the metallic tank material against corrosion or reaction with the substances to be transported

Note 1 to entry: This does not apply to lining or coating used only to protect the substance to be carried.

3.5**repair**

correction of a defect which may have impaired the safety of the tank or where equipment that communes directly with the shells content or safety device is replaced; it does not include normal service and maintenance operations of the shell or service equipment or replacement of gaskets or service equipment to the same specification.

3.6**technical code**

code or standard(s) according to which the tank has been designed and constructed

Note 1 to entry: RID/ADR use this term in context with tanks which are NOT designed, constructed and tested according to referenced standards. For the purpose of this standard, EN 14025 [3] and EN 13094 [4] are considered to be technical codes.

4 Inspections and tests

4.1 General

In accordance with the relevant regulations concerning the transport of dangerous goods, shells and their equipment shall undergo inspections for issuing the type approval certificate and initial, intermediate and periodic inspections and exceptional checks, if needed, as indicated in the survey table in Annex A and as given in this standard.

4.2 Inspection for type approval

4.2.1 General

The inspection for type approval shall be carried out on a prototype tank of either a single tank or a range of tanks. A type approval which includes a limited variation of the design will allow the following variations to the design without requiring a new approval, if there are no other conflicting technical or legal requirements:

- a decrease in the initial design temperature range;
- a decrease in the maximum gross mass;
- a reduction in volume only resulting from variations in diameter (not applicable to non-cylindrical tanks) and length; the approval file includes a calculation for each proposed diameter, length and number of compartments of the tank under the most unfavourable conditions, i.e.:
 - greatest density of goods; [SIST EN 12972:2015](https://standards.iteh.ai/catalog/standards/sist/691f8f9b-9edf-4e80-8019-ca527bdd13dc/sist-en-12972-2015)
 - greatest tank length and diameter;
 - greatest tank front compartment;
 - greatest tank rear compartment;
- a variation in the grade of the material used; in the case of austenitic and austenitic-ferritic steels and aluminium alloys different grades may be allowed with the following reserves:
 - use of the same qualified welding procedure;
 - calculation is carried out in the most unfavourable case, in particular the mechanical characteristics selected are for each element the lowest values of the grades used;
 - the instruction manual specifies the alternatives for compatibility with the substances being carried;
- movement or modification of nozzles and manholes provided that the same level of protection is afforded and the tank strength calculation takes into account the most unfavourable case;
- a decrease in the number of nozzles;
- an increase of the number of baffles and surge plates;
- an increase of the wall thickness provided the same welding procedures are used;
- a decrease of the maximum working pressure;

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- an increase in the thickness of the insulation used for additional protection;
- an increase in the effectiveness of the thermal insulation of the tank;
- the use of alternative service equipment if there is no change in the technical specification of the equipment and it is placed in the same location.

The inspection for type approval in the case of a modification of a tank shall be carried out on the parts of the tank that have been modified.

4.2.2 Content of inspection**4.2.2.1 Inspection for initial type approval**

The inspection for initial type approval shall be carried out in accordance with the following subclauses:

- examination of documents (see 5.2.1);
- check of the design characteristics (see 5.3);
- inspection of the tank interior (see 5.4);
- inspection of the tank exterior (see 5.5);
- hydraulic pressure test (see 5.6);
- vacuum test (see 5.7, only if required and if no calculation or FE-analysis has been provided);
- leakproofness test (see 5.8);
- determination of water capacity (see 5.9);
- inspection of service equipment (see 5.10);
- inspection of frame or other structural equipment of portable tanks and tank containers (see 5.11);
- dynamic longitudinal impact test of portable tanks (see 5.12).

The inspection for type approval to allow the amendment of the type approval shall be carried out as a re-examination of the respective applicable clauses of the original inspection for type approval.

4.2.2.2 Inspection for modifications

If there is a modification to the tank the applicable units of the inspection for initial type approval shall be reappraised.

4.2.3 Documentation

The results of the inspection for type approval shall be recorded by the expert in a test report.

NOTE A preliminary report can be issued after examination of the documents.

In addition to the test report it is recommended that a data sheet is submitted to assist the issuing of type approval (see Annex B).

4.3 Initial inspection

4.3.1 Content of inspection

The initial inspection shall be carried out in accordance with the following subclauses:

- examination of documents (see 5.2.2);
- check of the design characteristics (see 5.3);
- inspection of the tank interior (see 5.4);
- inspection of the tank exterior (see 5.5);
- hydraulic pressure test (see 5.6);
- leakproofness test (see 5.8);
- determination of water capacity (see 5.9; only where required by regulation for individual tanks);
- inspection of service equipment (see 5.10);
- inspection of frame or other structural equipment of portable tanks and tank containers (see 5.11).

4.3.2 Documentation, certification and marking

The results of the initial inspection shall be recorded by the expert on a certificate. An individual tank that has been tested and passed for type approval shall be issued with an initial inspection certificate. Certification and marking shall be in accordance with 5.13.

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4.4 Periodic inspection

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4.4.1 Content of inspection

The periodic inspection shall be carried out in accordance with the following subclauses:

- examination of documents (see 5.2.3);
- inspection of the tank interior (see 5.4);
- inspection of the tank exterior (see 5.5);
- hydraulic pressure test (see 5.6);
- leakproofness test (see 5.8);
- inspection of service equipment (see 5.10);
- inspection of frame or other structural equipment of portable tanks and tank containers (see 5.11).

For vacuum insulated tanks the inspection of the tank interior and the hydraulic pressure test are not required provided that a satisfactory vacuum in accordance with the manufacturer's specification is confirmed by measurement and simultaneously a leakproofness test is carried out.

If, openings have been made in shells intended for the carriage of refrigerated liquefied gases, the method by which they are hermetically closed before the shells are returned to service shall be inspected according to 4.6.4.

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In the case of tanks intended for the carriage of powdery or granular substances the hydraulic pressure test may be omitted and replaced by the leakproofness test (see 5.8).

4.4.2 Documentation, certification and marking

The results of the periodic inspection shall be recorded by the expert on a certificate. Any defect found which can impair the safety of the tank or the equipment and any related repairs carried out shall be recorded on the certificate. Certification and marking shall be in accordance with 5.13.

4.5 Intermediate inspection

4.5.1 Content of inspection

The intermediate inspection shall be carried out in accordance with the following subclauses:

- examination of documents (see 5.2.4);
- inspection of the tank interior (see 5.4; only where required by regulation);
- inspection of the tank exterior (see 5.5);
- leakproofness test (see 5.8);
- inspection of service equipment (see 5.10);
- inspection of frame or other structural equipment of portable tanks and tank containers (see 5.11; only where required by regulation).

4.5.2 Documentation, certification and marking

The results of the intermediate inspection shall be recorded by the expert on a certificate. Any defect found which can impair the safety of the tank or the equipment and any related repairs carried out shall be recorded on the certificate. Certification and marking shall be in accordance with 5.13.

4.6 Exceptional checks

4.6.1 Exceptional check after damage or repair of the shell

The exceptional check after damage of the shell which can have impaired the safety of the tank, and/or after repair, shall be carried out in accordance with the following subclauses to the extent as is applicable:

- examination of documents (see 5.2.5);
- check of the design characteristics (see 5.3);
- inspection of the tank interior (see 5.4);
- inspection of the tank exterior (see 5.5);
- hydraulic pressure test (see 5.6);
- leakproofness test (see 5.8);
- inspection of service equipment (see 5.10).

4.6.2 Exceptional check after the repair or replacement of service equipment

The exceptional check after the repair or replacement of the service equipment shall be carried out in accordance with the following subclauses to the extent as is applicable:

- examination of documents (see 5.2.5);
- check of the design characteristics (see 5.3);
- leakproofness test (see 5.8);
- inspection of service equipment (see 5.10).

4.6.3 Exceptional check after replacement of service equipment involving the application of heat

The exceptional check after exchange of the service equipment involving the application of heat (for example welding or cutting) which can have impaired the safety of the tank or the service equipment shall be carried out in accordance with the following subclauses to the extent as is applicable:

- examination of documents (see 5.2.5);
- check of the design characteristics (see 5.3);
- inspection of the tank interior (see 5.4);
- inspection of the tank exterior (see 5.5);
- hydraulic pressure test (see 5.6);
- leakproofness test (see 5.8);
- inspection of service equipment (see 5.10).

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4.6.4 Exceptional check after alteration to the tank

If there is an alteration to the tank within the scope of the type approval the applicable units of the inspection for type approval shall be reappraised .

4.6.5 Exceptional check after exchange or repair of frame or structural equipment

The exceptional check after exchange or repair of frame or structural equipment shall be carried out in accordance with the following subclauses to the extent as is applicable:

- examination of documents (see 5.2.5);
- check of the design characteristics (see 5.3);
- inspection of frame or other structural equipment of portable tanks and tank containers (see 5.11).

4.6.6 Exceptional check before and after repair or replacement of the protective lining or coating

The exceptional check before and after repair or replacement of the protective lining or coating whose defect can impair the safety of the tank shall be carried out in accordance with the following subclauses to the extent as is applicable:

- examination of documents (see 5.2.5);