



# SLOVENSKI STANDARD SIST EN 12972:2018+A1:2024

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## Cisterne za prevoz nevarnega blaga - Preskušanje, pregled in označevanje kovinskih cistern

Tanks for the 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 des matières dangereuses - Épreuve, contrôle et marquage des citernes métalliques

**Ta slovenski standard je istoveten z: EN 12972:2018+A1:2024**

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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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## Tanks for the 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 20 May 2018 and includes Amendment 1 approved by CEN on 19 February 2024.

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## European foreword

This document (EN 12972:2018+A1:2024) has been prepared by Technical Committee CEN/TC 296 “Tanks for the 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of an identical text or by endorsement, at the latest by November 2024, and conflicting national standards shall be withdrawn at the latest by November 2024.

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.

This document includes Amendment 1 approved by CEN on 19 February 2024.

This document supersedes A1 EN 12972:2018 A1.

The start and finish of text introduced or altered by amendment is indicated in the text by tags A1 A1.

A1 *deleted text* A1

In comparison with EN 12972:2015, the following fundamental changes have been made:

- a) alignment with RID [1] and ADR [2] as known at publication of this document;
- b) update of the normative references;
- c) addition of requirements for NDT and manufacturing tolerances;
- d) amendment of hydraulic pressure test and leakproofness test;
- e) deletion of Subclauses 5.6.4 “Test fluid” and 5.6.5 “Precautions for gas as a test fluid”;
- f) deletion of Annex C “Hydraulic pressure testing with gases – hazards and precautions”.

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

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

**EN 12972:2018+A1:2024 (E)****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. This document becomes mandatory if declared as such in the relevant regulation concerning the transport of dangerous goods. In all the other cases, it will remain voluntary like any European Standard, and aim at being used as a guidance for the testing, inspection and marking of metallic tanks.

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## 1 Scope

This document specifies testing, inspection and marking for the type approval, initial inspection, periodic inspection, intermediate inspection and  $\boxed{A_1}$  exceptional inspection  $\boxed{A_1}$  of metallic tanks (shell and equipment) of fixed tanks (tank vehicles), demountable tanks, tank-wagons, portable tanks and tank containers for the transport of dangerous goods.

This document 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.

## 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.

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 12663-2, *Railway applications - Structural requirements of railway vehicle bodies – Part 2: Freight wagons*

EN 13094:2015, *Tanks for the transport of dangerous goods - Metallic tanks with a working pressure not exceeding 0,5 bar - Design and construction*

EN ISO 148-1, *Metallic materials - Charpy pendulum impact test – Part 1: Test method (ISO 148-1)*

EN ISO 3452-1, *Non-destructive testing - Penetrant testing – Part 1: General principles (ISO 3452-1)*

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

EN ISO 4136, *Destructive tests on welds in metallic materials - Transverse tensile test (ISO 4136)*

EN ISO 5173, *Destructive tests on welds in metallic materials - Bend tests (ISO 5173)*

$\boxed{A_1}$  EN ISO 5817, *Welding - Fusion-welded joints in steel, nickel, titanium and their alloys (beam welding excluded) - Quality levels for imperfections (ISO 5817)  $\boxed{A_1}$*

EN ISO 6520-1:2007, *Welding and allied processes - Classification of geometric imperfections in metallic materials – Part 1: Fusion welding (ISO 6520-1:2007)*

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EN ISO 9015-1:2011, *Destructive tests on welds in metallic materials - Hardness testing – Part 1: Hardness test on arc welded joints (ISO 9015-1:2001)*

EN ISO 9016:2012, *Destructive tests on welds in metallic materials - Impact tests - Test specimen location, notch orientation and examination (ISO 9016:2012)*

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 9712, *Non-destructive testing - Qualification and certification of NDT personnel (ISO 9712)*

**A1** EN ISO 10042, *Welding - Arc-welded joints in aluminium and its alloys - Quality levels for imperfections (ISO 10042)*

EN ISO 10863, *Non-destructive testing of welds - Ultrasonic testing - Use of time-of-flight diffraction technique (TOFD) (ISO 10863) **A1***

EN ISO 11666, *Non-destructive testing of welds - Ultrasonic testing - Acceptance levels (ISO 11666)*

**A1** EN ISO 13588, *Non-destructive testing of welds - Ultrasonic testing - Use of automated phased array technology (ISO 13588) **A1***

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)*

**A1** EN ISO 15626, *Non-destructive testing of welds - Time-of-flight diffraction technique (TOFD) - Acceptance levels (ISO 15626) **A1***

CEN ISO/TR 15608, *Welding - Guidelines for a metallic materials grouping system (ISO/TR 15608)*

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)*

EN ISO 17636-1, *Non-destructive testing of welds - Radiographic testing - Part 1: X- and gamma-ray techniques with film (ISO 17636-1)*

EN ISO 17636-2, *Non-destructive testing of welds - Radiographic testing - Part 2: X- and gamma-ray techniques with digital detectors (ISO 17636-2)*

EN ISO 17637, *Non-destructive testing of welds - Visual testing of fusion-welded joints (ISO 17637)*

EN ISO 17638, *Non-destructive testing of welds - Magnetic particle testing (ISO 17638)*

EN ISO 17639:2013, *Destructive tests on welds in metallic materials - Macroscopic and microscopic examination of welds (ISO 17639:2003)*

EN ISO 17640, *Non-destructive testing of welds - Ultrasonic testing - Techniques, testing levels, and assessment (ISO 17640)*

EN ISO 17643:2015, *Non-destructive testing of welds - Eddy current examination of welds by complex plane analysis (ISO 17643:2015)*

EN ISO 19285, *Non-destructive testing of welds - Phased array ultrasonic testing (PAUT) - Acceptance levels (ISO 19285)*

EN ISO 23277:2015, *Non-destructive testing of welds - Penetrant testing - Acceptance levels (ISO 23277:2015)*

EN ISO 23278:2015, *Non-destructive testing of welds - Magnetic particle testing - Acceptance levels (ISO 23278:2015)*

IMO MSC/Circ. 860, Guidelines for the approval of offshore containers handled in open seas<sup>1</sup>

UN Manual of Tests and Criteria, Part IV<sup>2</sup>

### 3 Terms, definitions, symbols and abbreviations

#### 3.1 Terms and definitions

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

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

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

NOTE 1 The definitions of terms used in this document are taken as those given by the applicable regulations concerning the transport of dangerous goods unless otherwise stated.

NOTE 2 Additional terms and definitions can be found in EN 14564 [4].

<sup>1</sup> May be purchased from the International Maritime Organization (IMO), 4 Albert Embankment, Lambeth, London SE1 7SR, United Kingdom.

<sup>2</sup> May be purchased from the United Nations Economic Commission for Europe (UNECE), 8 Avenue de la Paix, 1202 Geneva, Switzerland.

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dependent on national law, individual person approved by the competent authority, or national body approved by the competent authority, or inspection body approved by the competent authority, to perform designated inspections and tests in accordance with the scope of their approval

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

**3.1.2****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.

**3.1.3****repair**

correction of a defect

Note 1 to entry: It does not include normal service and servicing operations of the shell or service equipment or replacement of gaskets or service equipment to the same specification.

**3.1.4****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 [5] and EN 13094 are considered to be technical codes.

**3.1.5****modification**

<tanks for the transport of dangerous goods> work on an existing tank with a valid, or expired, or withdrawn type approval which causes a non-conformity with the type approval mentioned above

**3.1.6****alteration**

<tanks for the transport of dangerous goods> work on an existing tank with a valid, or expired, or withdrawn type approval leaving the tank inside the scope of the type approval provided the original type approval is in conformity with the relevant regulation on the transport of dangerous goods at the time of the work

### 3.2 Symbols and abbreviations

For the purpose of this document, the following symbols and abbreviations apply.

#### 3.2.1 General symbols and abbreviations:

$e$	nominal shell thickness
$D_i$	internal tube diameter
NDT	non-destructive testing
$\lambda$	joint coefficient

#### 3.2.2 NDT symbols (used in Tables 1 and 2):

VT	Visual testing
UT	Ultrasonic testing
PT	Penetrant testing
MT	Magnetic particle testing
RT	Radiographic testing
ET	Eddy current testing

#### 3.2.3 Weld position symbols (see Figure 1, used in Table 1):

N	“Tee”-junction (weld node)
C	Circular (or transverse) joints of the same cylindrical or conical part and of a rotating or ring-shaped part
NC	Longitudinal joints or joints that do not belong to the C type

The weld of a hemispherical end is similar to a longitudinal weld (NC) when it is located beyond the cylindrical part of the end.

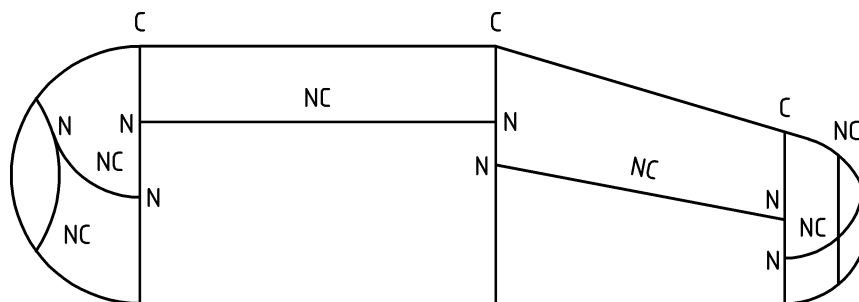


Figure 1 — Weld position symbols

**EN 12972:2018+A1:2024 (E)****3.2.4  $\square_{A1}$  Welding imperfection symbols (used in Table 3, Table 6 and Table 7)  $\square_{A1}$ :**

- a* nominal fillet weld throat thickness
- b* width of weld reinforcement (width of excess weld)
- d* diameter of pore
- h* height of imperfection
- l* length of imperfection
- t* wall or plate thickness
- w* width of imperfection

**3.2.5 Material property symbols (used in Annex B):**

- A* elongation at break
- R<sub>e</sub>* yield strength
- R<sub>m</sub>* tensile strength

**3.2.6 Manufacturing tolerance symbols (used in Annex F):**

- d<sub>1</sub>* middle line alignment
- D* internal shell diameter
- O* out of roundness
- P* peaking

**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, inspection for modification of a tank and initial, intermediate and periodic inspections and  $\square_{A1}$  exceptional inspections  $\square_{A1}$ , if needed, as indicated in the survey table in Annex A and as given in this standard.

All inspections and tests carried out according to this document shall state the condition of the tank at the time of inspection or testing.

**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;