

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

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 12972:2018 sisaldab Euroopa standardi EN 12972:2018 ingliskeelset teksti.	This Estonian standard EVS-EN 12972:2018 consists of the English text of the European standard EN 12972:2018.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 04.07.2018.	Date of Availability of the European standard is 04.07.2018.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 13.300, 23.020.20

Standardite reprodutseerimise ja levitamise õigus kuulub Eesti Standardikeskusele

Andmete paljundamine, taastekitamine, kopeerimine, salvestamine elektroonsesse süsteemi või edastamine ükskõik millises vormis või millisel teel ilma Eesti Standardikeskuse kirjaliku loata on keelatud.

Kui Teil on küsimusi standardite autorikaitse kohta, võtke palun ühendust Eesti Standardikeskusega:
Koduleht www.evs.ee; telefon 605 5050; e-post info@evs.ee

The right to reproduce and distribute standards belongs to the Estonian Centre for Standardisation

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying, without a written permission from the Estonian Centre for Standardisation.

If you have any questions about copyright, please contact Estonian Centre for Standardisation:

Homepage www.evs.ee; phone +372 605 5050; e-mail info@evs.ee

English Version

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

Citernes destinées au transport de 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.

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-CENELEC 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-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of 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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

Contents

Page

European foreword.....	5
Introduction	6
1 Scope.....	7
2 Normative references.....	7
3 Terms, definitions, symbols and abbreviations.....	9
3.1 Terms and definitions	9
3.2 Symbols and abbreviations	10
4 Inspections and tests	12
4.1 General.....	12
4.2 Inspection for type approval.....	12
4.2.1 General.....	12
4.2.2 Content of inspection	13
4.2.3 Documentation.....	14
4.3 Inspection for modification of a tank.....	14
4.4 Initial inspection	14
4.4.1 Content of inspection	14
4.4.2 Documentation, certificate and marking.....	14
4.5 Periodic inspection.....	15
4.5.1 Content of inspection	15
4.5.2 Documentation, certificate and marking.....	15
4.6 Intermediate inspection	15
4.6.1 Content of inspection	15
4.6.2 Documentation, certificate and marking.....	16
4.7 Exceptional checks.....	16
4.7.1 General.....	16
4.7.2 Exceptional check after damage or repair of the shell	16
4.7.3 Exceptional check after the repair or replacement of service equipment.....	16
4.7.4 Exceptional check after replacement of service equipment involving the application of heat.....	16
4.7.5 Exceptional check after alteration to the tank.....	17
4.7.6 Exceptional check after exchange or repair of frame or structural equipment.....	17
4.7.7 Exceptional check before and after repair or replacement of the protective lining or coating.....	17
4.7.8 Documentation, certificate and marking.....	17
5 Procedures and documentation for inspections and tests.....	18
5.1 General.....	18
5.2 Examination of documents	18
5.2.1 Inspection for type approval.....	18
5.2.2 Initial inspection	20
5.2.3 Periodic inspection.....	21
5.2.4 Intermediate inspection	21
5.2.5 Exceptional check.....	22
5.3 Check of the design characteristics	23
5.3.1 Content of inspection	23
5.3.2 Examination of the manufacturing conditions.....	23

5.3.3	Inspection of the materials and wall thicknesses.....	23
5.3.4	Examination of the manufacturing methods.....	24
5.3.5	Inspection of main dimensions.....	24
5.3.6	NDT of the welds.....	24
5.3.7	Mechanical tests.....	31
5.4	Inspection of the shell interior.....	34
5.4.1	Inspection of the condition of the shell.....	34
5.4.2	Inspection of protective lining or coating.....	34
5.5	Inspection of the tank exterior.....	34
5.5.1	Inspection of the condition of the tank.....	34
5.5.2	Inspection of the fastenings of the tank and its structural equipment.....	35
5.5.3	Inspection of marking.....	35
5.5.4	Inspection of earth connection.....	35
5.6	Hydraulic pressure test.....	35
5.6.1	General.....	35
5.6.2	Extent of test.....	35
5.6.3	Test pressure.....	36
5.6.4	Test liquid.....	37
5.6.5	Gas as test fluid.....	37
5.6.6	Pressurization.....	37
5.6.7	Test duration.....	37
5.6.8	Measurement.....	37
5.6.9	Evaluation of the test.....	38
5.7	Vacuum testing.....	38
5.7.1	Test procedure.....	38
5.7.2	Measurement.....	38
5.7.3	Evaluation of the test.....	38
5.8	Leakproofness test.....	38
5.8.1	General.....	38
5.8.2	Extent of test.....	39
5.8.3	Leakproofness test pressure.....	39
5.8.4	Leakproofness test fluid.....	40
5.8.5	Pressurization.....	40
5.8.6	Test duration.....	40
5.8.7	Special leakproofness test of the mounting of certain items of equipment.....	41
5.8.8	Evaluation of the test.....	41
5.9	Determination of water capacity.....	41
5.10	Inspection of service equipment.....	42
5.10.1	General.....	42
5.10.2	Inspection of service equipment for type approval of the tank.....	42
5.10.3	Inspection of service equipment for other inspections.....	42
5.10.4	Check of satisfactory operation of service equipment.....	42
5.11	Inspection of frame or other structural equipment of portable tanks and tank containers.....	43
5.11.1	Inspection of frame or other structural equipment for type approval.....	43
5.11.2	Initial, periodic, intermediate inspection and exceptional check of the frame or other structural equipment of portable tanks and tank containers.....	44
5.12	Dynamic longitudinal impact test.....	44
5.12.1	Portable tanks.....	44
5.12.2	Tank-wagons.....	44
5.13	Test report, certificate and marking.....	44
5.13.1	Test report for type approval.....	44
5.13.2	Certificate of initial, periodic and intermediate inspection and exceptional check.....	44

5.13.3 Marking.....	44
Annex A (informative) Applicable items of tank inspection — Survey Table	46
Annex B (normative) Technical data sheet for type approval.....	48
Annex C (informative) Certificate of initial, periodic and intermediate inspection and exceptional check.....	52
Annex D (informative) Tank plates for fixed tanks (tank vehicles) and demountable tanks for the transport of dangerous goods	54
D.1 Tank plate	54
D.2 Content of the marking of the tank plate.....	55
Annex E (normative) Tank plates for tank containers for the transport of dangerous goods.....	56
E.1 Tank plate for tank containers for the transport of dangerous goods	56
E.2 Tank plate for tank containers for the transport of gases	57
Annex F (normative) Manufacturing tolerances (based on EN 13445-4 [16])	60
F.1 Surface geometry of welds.....	60
F.2 Middle line alignment.....	60
F.3 Surface alignment	60
F.3.1 Surface linear misalignment between parts	60
F.3.2 Joining of parts of different thickness	61
F.4 Tolerances for tanks	61
F.4.1 External diameter	61
F.4.2 Out of roundness	61
F.4.3 Deviation from the longitudinal axis	61
F.4.4 Irregularities in profile	61
F.4.5 Middle line angular misalignment.....	63
F.4.6 Dished ends	63
Bibliography.....	64

European foreword

This document (EN 12972:2018) 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 January 2019, and conflicting national standards shall be withdrawn at the latest by January 2019.

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 supersedes EN 12972:2015.

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

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”.

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, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

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.

This document is a preview generated by EVS

1 Scope

This document 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, 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)*

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

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)*

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

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)*

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 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 seas¹

UN Manual of Tests and Criteria, Part IV²

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 terminological 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 [3].

3.1.1 expert

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.

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

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