

Tanks for the transport of dangerous goods - Metallic
gravity-discharge tanks - Design and construction

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN 13094:2020 sisaldab Euroopa standardi EN 13094:2020 ingliskeelset teksti.	This Estonian standard EVS-EN 13094:2020 consists of the English text of the European standard EN 13094:2020.
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 22.07.2020.	Date of Availability of the European standard is 22.07.2020.
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ICS 13.300, 23.020.20

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English Version

Tanks for the transport of dangerous goods - Metallic gravity-discharge tanks - Design and construction

Citernes pour le transport de matières dangereuses -
Citernes métalliques à vidange par gravité - Conception
et construction

Tanks für die Beförderung gefährlicher Güter -
Metalltanks mit Entleerung durch Schwerkraft -
Auslegung und Bau

This European Standard was approved by CEN on 1 June 2020.

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

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Contents

Page

European foreword	5
1 Scope.....	7
2 Normative references.....	7
3 Terms, definitions, symbols and abbreviations	9
3.1 Terms and definitions	9
3.2 Symbols	10
3.3 Abbreviations.....	11
4 Service equipment.....	11
5 Materials	11
5.1 General.....	11
5.2 Material properties.....	12
5.3 Compatibility of tank materials with substances carried	13
6 Design.....	14
6.1 Shell cross-section	14
6.2 Design verification	16
6.3 Dynamic conditions	17
6.4 Pressure conditions	18
6.5 Partial vacuum conditions.....	18
6.6 Design temperature	18
6.7 Design stress.....	18
6.8 Shell thicknesses	18
6.9 Shell openings, neck rings and closures	23
6.10 Shell partitions, surge plates and baffles	24
6.11 Shell supporting structure.....	24
6.12 Other attachments to the shell.....	25
6.13 Pipework passing through the shell	25
6.14 Protection of service equipment mounted on the tank top.....	26
6.15 Electrical bonding and earthing	33
7 Manufacture of the shell.....	33
7.1 General.....	33
7.2 Cutting and edge preparation	33
7.3 Forming	34
7.4 Welding.....	34
7.5 Manufacturing tolerances.....	36
7.6 Rectification of defects.....	37
8 Marking	37
Annex A (informative) Methods of design verification	38
A.1 General.....	38
A.2 Dynamic testing.....	38
A.2.1 Methods for the verification of the loads specified in 6.3.2.....	38
A.2.2 Test programme.....	39
A.3 Finite element method.....	39
A.3.1 General.....	39

A.3.2	Software selection	40
A.3.3	Validation	40
A.3.4	Finite element mesh	41
A.3.5	Mesh criteria	41
A.3.6	Approval.....	42
A.3.7	Requirements relating to the methods for determining stresses.....	42
A.3.8	Assessment criteria	43
A.3.9	Permanent record	45
A.4	Reference design.....	45
A.5	Calculation method — worksheet	46
A.5.1	Introduction	46
A.5.2	Symbols and units.....	48
A.5.3	Adopted thicknesses.....	54
A.5.4	Mandatory thicknesses.....	54
A.5.4.1	Calculated thicknesses.....	54
A.5.5	Verification of stresses at test pressure	55
A.5.6	Verification of stresses in service condition.....	58
A.5.7	Calculation of stress in shell attachments	64
A.5.8	End made up of several welded elements.....	65
Annex B (normative)	Method of measurement of specific resilience.....	66
B.1	Principle.....	66
B.2	Apparatus	66
B.3	Samples of materials to be tested	70
B.4	Procedure	71
B.5	Results	72
B.5.1	Test values.....	72
B.5.2	Calculation of results.....	73
B.5.3	Acceptability of material.....	73
B.6	Global resilience [see 6.8.2.2 i)]	73
B.7	Comparative methods to calculate the energy absorbed during an overturning or impact [see 6.8.2.2 j)]	73
B.7.1	Calculation of absorbed energy	73
B.7.2	Test procedure	74
B.7.3	Finite element analysis procedure to be adopted	74
Annex C (normative)	Design of neck rings, flanges and closures.....	75
Annex D (informative)	Examples of welding details.....	76
D.1	General	76

D.2	Shell construction.....	76
D.2.1	Fillet welds	76
D.2.2	Joint types.....	78
D.3	Attachment of reinforcements	88
D.3.1	Attachment of reinforcements designed to absorb dynamic stress.....	88
D.3.2	Attachment of reinforcements not designed to absorb dynamic stress	88
D.4	Attachment of branches.....	89
D.5	Attachment of flanges, collars and reinforcing pads to the shell	91
D.6	Attachment of flanges onto branches	92
D.7	Attachment of heating channels to shells	93
	Bibliography	95

European foreword

This document (EN 13094:2020) 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 2021, and conflicting national standards shall be withdrawn at the latest by January 2021.

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 13094:2015.

Compared with EN 13094:2015, the following are the principal changes that have been made:

- a) changes to reflect the change in scope from low pressure to gravity-discharge applications;
- b) updates to the normative references;
- c) changes to the terms, definitions, symbols and abbreviations;
- d) simplification of service equipment requirements by reference to regulatory requirements;
- e) clarification of impact strength required at lower design temperatures;
- f) new requirements on the cross-sectional shapes of shells for non-circular cross-sections, sumps and other external projections and cut-outs within the contour of a side or bottom of the shell;
- g) clearer requirements on design verification;
- h) expansion of provisions for the dynamic conditions used for tank design;
- i) provisions for pressure conditions revised to reflect the change in scope;
- j) clarification that maximum stress refers to maximum membrane stress;
- k) expansion of requirements on shell thickness to clarify and include cut-outs;
- l) addition of preferred location of tank top service equipment;
- m) partial easing of restriction on longitudinal partitions;
- n) additional requirements on pipes passing through the shell;
- o) general revisions on the protection of service equipment mounted on the top of the tank;
- p) new requirements for electrical bonding and earthing;
- q) changes to the assessment criteria for welds not covered by either Annex D or EN 14025;
- r) examination and testing of welds referred to EN 12972;

- s) manufacturing tolerances referred to EN 12972;
- t) new requirements for minimum shell marking;
- u) tank plate requirements addressed by reference to regulatory requirements;
- v) clarification and revision of the application of the different methods of design verification in Annex A;
- w) addition of finite element analysis as a method of measurement of specific resilience in Annex B;
- x) changes to clarify the informative examples of welding details in Annex D; and
- y) an addition to the bibliography.

This document has been submitted for reference in:

- the RID; and
- the technical annexes of the ADR.

NOTE These regulations take precedence over any clause of this document. It is emphasized that RID/ADR are being revised regularly at intervals of two years which may lead to temporary non-compliances with the clauses of this document."

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

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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, Turkey and the United Kingdom.

1 Scope

This document specifies requirements for the design and construction of metallic gravity-discharge tanks intended for the carriage of substances having a vapour pressure not exceeding 110 kPa (1,1 bar) (absolute pressure) at 50 °C.

NOTE 1 Gravity-discharge tanks have no maximum working pressure. However, during operation, pressure in the shell may occur, for example due to flow restrictions in vapour recovery systems or opening pressures of breather devices. It is important that these operating pressures do not exceed the test pressure of the tank or 0,5 bar, whichever is the highest.

This document specifies requirements for openings, closures, pipework, mountings for service equipment and structural equipment.

NOTE 2 This document does not specify requirements for items of service equipment other than pipes passing through the shell.

This document is applicable to aircraft refuelers that are used on public roads. It is also applicable to inter-modal tanks (e.g. tank containers and tank swap bodies) for the transport of dangerous goods by road and rail.

NOTE 3 This document is not applicable to fixed rail tank wagons.

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 10204, *Metallic products - Types of inspection documents*

EN 10028-2, *Flat products made of steels for pressure purposes - Part 2: Non-alloy and alloy steels with specified elevated temperature properties*

EN 12972, *Tanks for transport of dangerous goods - Testing, inspection and marking of metallic tanks*

EN 13317, *Tanks for transport of dangerous goods - Service equipment for tanks - Manhole cover assembly*

EN 14025, *Tanks for the transport of dangerous goods - Metallic pressure tanks - Design and construction*

EN 13445-3:2014, *Unfired pressure vessels - Part 3: Design*

EN 14564, *Tanks for transport of dangerous goods - Terminology*

EN ISO 3834-1, *Quality requirements for fusion welding of metallic materials - Part 1: Criteria for the selection of the appropriate level of quality requirements (ISO 3834-1)*

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

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

EN ISO 6892-1, *Metallic materials - Tensile testing - Part 1: Method of test at room temperature (ISO 6892-1)*

EN ISO 7500-1, *Metallic materials - Calibration and verification of static uniaxial testing machines - Part 1: Tension/compression testing machines - Calibration and verification of the force-measuring system (ISO 7500-1)*

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

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)*

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 15609-2, *Specification and qualification of welding procedures for metallic materials - Welding procedure specification - Part 2: Gas welding (ISO 15609-2)*

EN ISO 15613, *Specification and qualification of welding procedures for metallic materials - Qualification based on pre-production welding test (ISO 15613)*

EN ISO 15614 (all parts), *Specification and qualification of welding procedures for metallic materials - Welding procedure test (ISO 15614, all parts)*

EN ISO 17635, *Non-destructive testing of welds - General rules for metallic materials (ISO 17635)*

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

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

ISO 1496-3, *Series 1 freight containers - Specification and testing - Part 3: Tank containers for liquids, gases and pressurized dry bulk*