



**SLOVENSKI STANDARD**  
**SIST EN 13094:2020/oprA1:2021**  
**01-december-2021**

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**Cisterne za prevoz nevarnega blaga - Kovinske cisterne z gravitacijskim praznjenjem - Konstruiranje in izdelava - Dopolnilo A1**

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

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

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

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**Ta slovenski standard je istoveten z: EN 13094:2020/prA1**

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**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  
NORME EUROPÉENNE  
EUROPÄISCHE NORM

**DRAFT**  
**EN 13094:2020**  
**prA1**

December 2021

ICS 13.300; 23.020.20

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 draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 296.

This draft amendment A1, if approved, will modify the European Standard EN 13094:2020. If this draft becomes an amendment, CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for inclusion of this amendment into the relevant national standard without any alteration.

This draft amendment was established by CEN 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.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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

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

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## European foreword

This document (EN 13094:2020/prA1:2021) 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 document is currently submitted to the CEN Enquiry.

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**EN 13094:2020/oprA1:2021 (E)****1 Modifications to the European foreword**

Replace list items r) and s) with the following amended text:

"

r) examination and testing of welds referred to EN 12972:2018;

NOTE 1 Acceptable equivalent requirements for the examination and testing of welds are given in subclause 7.4.4 of this document.

s) manufacturing tolerances referred to EN 12972:2018;"

Renumber "NOTE" as "NOTE 2".

Delete the following paragraph:

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

**2 Modification to Clause 2, "Normative references"**

Replace "EN 12972" with "'EN 12972:2018".

**3 Modifications to Clause 4, "Service equipment"**

After the first paragraph, insert the following paragraph and NOTE 1:

"Tanks shall be equipped with a breather device and a safety device to prevent the contents from spilling out if the tank overturns. For compartmented tanks, each compartment shall be so equipped.

NOTE 1 Referenced standards for service equipment are listed in ADR 6.8.2.6.9fa-98780fa6de65/sist-en-13094-2020-opra1-2021

Renumber "NOTE" as "NOTE 2".

**4 Modifications to Clause 5, "Materials"**

In 5.2.2.1.2, in the second list item, replace " $R_e$ " with " $R_e$  and  $R_m$ " to read:

"— the value of  $R_e$  and  $R_m$  used in the calculation does not exceed 1,15 multiplied by the value of  $R_e$  and  $R_m$  as specified for the material selected in accordance with the relevant standard for the material."

In 5.3.4, replace the current Note with the following:

"NOTE In RID/ADR (7.5.10), this requirement is also applicable to UN No. 1361 carbon and UN No. 1361 carbon black, packing group II."

**5 Modifications to Clause 6, "Design"**

In 6.3.1, replace "EN 12972" with "EN 12972:2018".

In 6.4.2, NOTE, replace "EN 12972" with "EN 12972:2018".

In 6.7, delete "of the supporting structure" to read:

"The maximum membrane stress in the material of the shell and its supporting structure shall not exceed the lower of  $0,75 R_e$  or  $0,5 R_m$ ; for tank containers and tank swap bodies, the stress in the material shall not exceed  $0,66 R_e$ ."

In 6.9.1, add the following sentence after the first sentence:

“Any thermal insulation shall be so designed as not to hinder access to, or the operation of, filling and discharge devices and safety valves.”.

## 6 Modifications to Clause 7, "Manufacture of the shell"

In 7.4.4 and 7.5.1, replace "EN 12972" with "EN 12972:2018" (three times).

## 7 Modification to Clause 8, "Marking"

Replace "EN 12972" with "EN 12972:2018".

## 8 Modifications to Annex A, "Methods of design verification"

Replace "(informative)" with "normative" in the title of Annex A as follows:

### Annex A (normative)

In A.3.6, delete “e) as an alternative to d) the stresses have been evaluated in accordance with EN 13445-3:2014, Annex C;” and renumber list item “f) as “e)”.

In A.4, first paragraph and in the NOTE replace "EN 12972" with "EN 12972:2018".

In A.5.1.1, 2<sup>nd</sup> list item, replace "MPa" with " $P_{ts}$ " to read:

“— other cross-sections with  $P_{ts}$  not exceeding 0,014 MPa(14 kPa).”.

In A.5.1.2.4, replace the text in list item c) with the following:

“

c) partitions: the maximum of [SIST EN 13094:2020/oprA1:2021](https://standards.iteh.ai/catalog/standards/sist/d087ad6d-5c23-4680-b9fa-93780fa6de65/sist-en-13094-2020-opra1-2021)

- $P_{ts}$  increased by the static pressure due to the height of the densest substance to be carried for the shell section studied;
- static pressure due to the height of the densest substance to be carried for the shell section studied multiplied by 1,3;
- static pressure due to the height of water for the shell section studied multiplied by 1,3
- 0,02 MPa.”.

In A.5.2.2.2, Table A.4, replace the formula in footnote c with the following:

“

$$P_{\text{dyn}} = \frac{M_p}{S_T}$$

”.

**EN 13094:2020/prA1:2021 (E)**

In A.5.5.2.2, replace Formula (A.5) with the following:

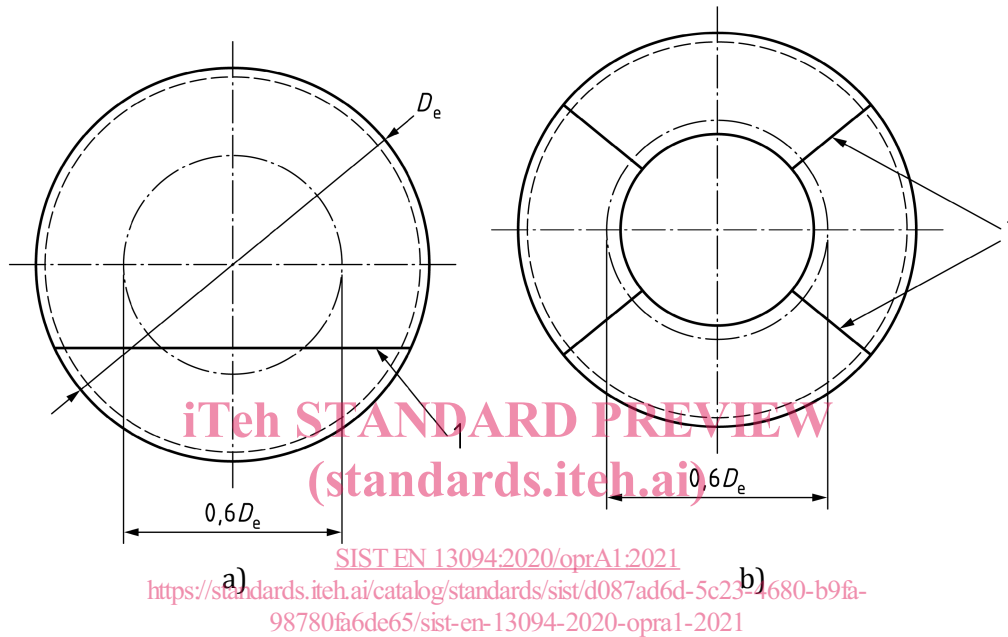
“

$$E_c = \frac{100R_1^2 \times 2,2P_e}{36,6e_f^2}$$

”

In A.5.8, replace Figure A.3 with the following:

“



”

Replace the NOTE in Figure A.3 with the following:

“NOTE Also applicable to ends with an elliptical or other cross-section.”

## 9 Modifications to Annex D, “Examples of welding details”

In D.2.2.3, p3, delete the “a)” to read “Figure D.7”.

In p4, delete “having an outward facing concavity” to read: “Single-weld lap joints are acceptable for ends; the joint should include an overlap of at least 15 mm (see Figure D.8).”

In the Figure D.6 key, insert “ $W \geq 0,7e_2$ ” above key part 1 as follows:

“Key

$W \geq 0,7e_2$

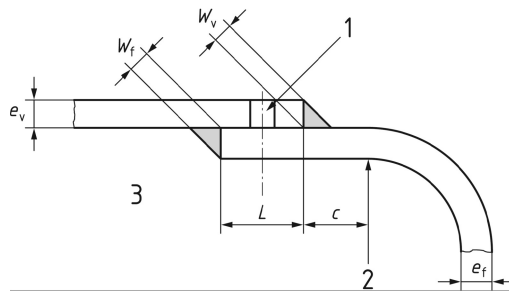
1 tell-tale hole

”



Replace Figure D.7 a) and b) with the following new Figure D.7:

“



”

Insert “ $L \geq 15 \text{ mm}$ ” in the figure key as follows:

“Key

$c \geq 2 e_v$

$e_v \leq 8 \text{ mm}$      $W_v \geq 0,7 e_v$

$e_f \leq 8 \text{ mm}$      $W_f \geq 0,7 e_{fv}$

$L \geq 15 \text{ mm}$

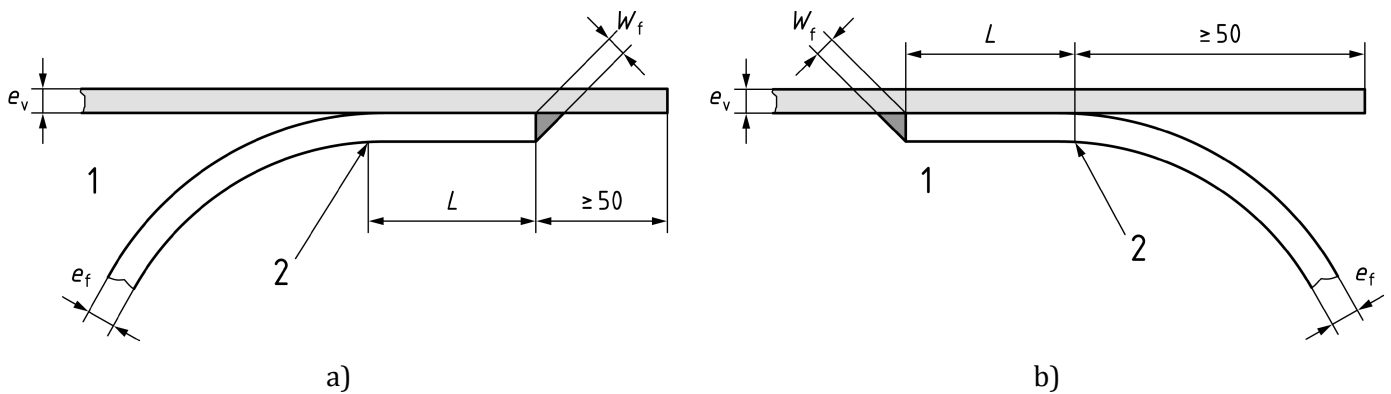
- 1 tell-tale hole
- 2 start of radius
- 3 inside of shell

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Replace Figure D.8 a) and b) and the figure key with the following:

“



Key

$c \geq 2 e_v$     -

$e_v \leq 8 \text{ mm}$      $W_v \geq 0,7 e_v$

$e_f \leq 8 \text{ mm}$      $W_f \geq 0,7 e_f$

$L \geq 15 \text{ mm}$

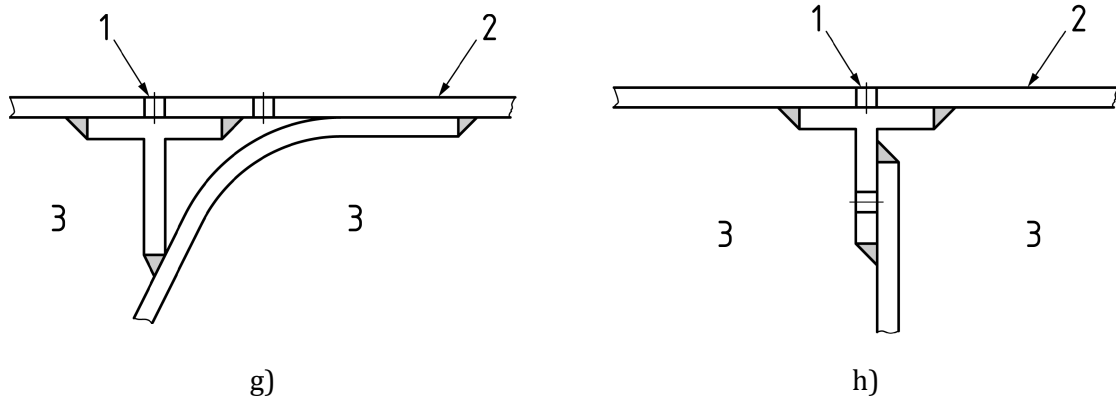
- 1 inside of shell
- 2 start of radius

”

EN 13094:2020/prA1:2021 (E)

In D.2.2.5.1, replace Figure D.11 g) and h) with the following:

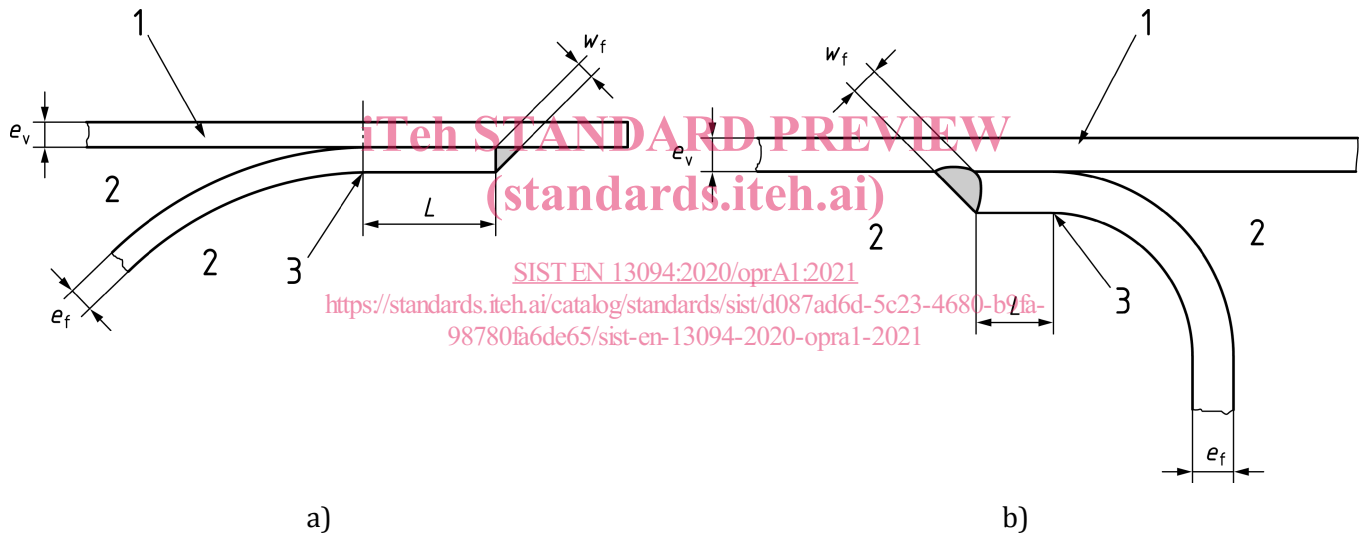
“



”

In D.2.2.5.2, replace Figure D.12 a) and b) with the following:

“



”

In the Figure D.12 key, insert “ $W_f \geq 0,7 e_f$ ” above key part 1 as follows:

“Key

$W_f \geq 0,7 e_f$

- 1 shell
- 2 inside of shell
- 3 start of radius

”