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**Specifikacija za konstruiranje in proizvodnjo na mestu postavitve grajenih navpičnih, valjastih, varjenih, jeklenih nadzemnih posod z ravnim dnom za shranjevanje tekočin pri temperaturi okolice ali višji temperaturi**

Specification for the design and manufacture of site built, vertical, cylindrical, flat-bottomed, above ground, welded, steel tanks for the storage of liquids at ambient temperature and above

Auslegung und Herstellung standortgefertigter, oberirdischer, stehender, zylindrischer, geschweißter Flachboden-Stahltanks für die Lagerung von Flüssigkeiten bei Umgebungstemperatur und höheren Temperaturen

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Spécification pour la conception et la fabrication de réservoirs en acier, soudés, aériens, à fond plat, cylindriques, verticaux, construit sur site destinés au stockage des liquides à la température ambiante ou supérieure

**Ta slovenski standard je istoveten z: prEN 14015**

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**ICS:**

23.020.10	Nepremične posode in rezervoarji	Stationary containers and tanks
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This draft European Standard is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 265.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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## European foreword

This document (prEN 14015:2017) has been prepared by Technical Committee CEN/TC 265 “Site built metallic tanks for the storage of liquids”, the secretariat of which is held by BSI.

This document is currently submitted to the CEN Enquiry.

This European Standard reflects the current practice within the oil, petrochemical, chemical, food and general bulk liquid storage industry, both European and world-wide. The practice is based on the theory of design stresses or allowable stresses.

There is another European standard, EN 1993-4-2 covering Tanks. It is based on the Limit State Theory (LST), which is being used more and more by the structure steel and reinforced concrete industry.

Based on the facts that:

- the calculation routines as per this version of EN 14015 result in somewhat more conservative values when compared to the results according to theory of EN 1993-4-2; and
- the experience in the oil and gas industry with designing steel storage tanks to the LST method is limited;

it is therefore considered necessary to keep the actual revision of the EN 14015 based on the allowable stress method.

It is envisaged that, in future revisions of EN 14015, the theory for designing steel storage tanks of the types covered in this norm might move towards the use of LST. However, this would need more time to define more accurate loads factors, loads combinations and serviceability.

It is considered that a tank designed in accordance with EN 14015 fulfils the requirements of EN 1993-4-2.

Moreover, this standard covers many more design items such as selection of type of tank based on characteristics of the stored medium (in Annex B), internal and external floating roofs (respectively in Annex C and D), rim seals (in Annex E), double bottoms (in Annex H) and specific other tank features which are not covered in EN 1993-4-2. EN 14015 also covers aluminium dome roof structures in Annex S.

**prEN 14015:2017 (E)****1 Scope**

This document specifies the requirements for the materials, design, fabrication, erection, testing and inspection of site built, vertical, cylindrical, flat bottomed, above ground, welded, steel tanks for the storage of liquids at ambient temperatures and above, and the technical agreements that need to be reached (see Annex A).

This document does not apply to tanks where the product is refrigerated to maintain it as a liquid at atmospheric pressure (see EN 14620 part 1 to 5).

This document is concerned with the structural integrity of the basic tank structure and does not provide requirements for considering process design, operational issues, safety and firefighting facilities, in-service inspection, maintenance or repair. These aspects are covered in detail in other Codes of Practice (see Annex B).

This document applies to closed-top tanks, with and without internal floating roofs (see Annex C) and open-top tanks, with and without floating roofs (see Annexes D and E). It does not apply to 'lift-type' gas holders.

This document applies to storage tanks with the following characteristics:

- a) design pressure less than 60 mbar<sup>1</sup> and design internal negative pressure not lower than 6,0 mbar (see 5.1 for pressure limitations);
- b) design metal temperature not lower than -40 °C and not higher than +300 °C (see 5.2.2);
- c) maximum design liquid level not higher than the top of the cylindrical shell.

The limits of application of this document terminate at the following locations:

- face of the first flange in a bolted flange connection;
- first threaded joint on the pipe or coupling outside of the tank shell, roof or bottom; and
- first circumferential joint in a pipe not having a flange connection.

This document is applicable to storage tanks where, irrespective of the material strength used, the maximum allowable stress does not exceed 260 N/mm<sup>2</sup>.

In addition to the definitive requirements, this document also states that the items detailed in Annex A have to be documented. For compliance with this document, both the definitive requirements and those required in Clause 4 are meant to be satisfied.

**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 485 (all parts), *Aluminium and aluminium alloys — Sheet, strip and plate*

EN 754 (all parts), *Aluminium and aluminium alloys — Cold drawn rod/bar and tube*

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<sup>1</sup> All pressures are in mbar gauge unless otherwise stated.

- EN 755 (all parts), *Aluminium and aluminium alloys — Extruded rod/bar, tube and profiles*
- EN 1092-1, *Flanges and their joints — Circular flanges for pipes, valves, fittings and accessories, PN designated — Part 1: Steel flanges*
- EN 1593, *Non-destructive testing - Leak testing - Bubble emission techniques*
- EN 1759-1, *Flanges and their joint - Circular flanges for pipes, valves, fittings and accessories, Class designated - Part 1: Steel flanges, NPS 1/2 to 24*
- EN 1991-1-3, *Eurocode 1 - Actions on structures - Part 1-3: General actions - Snow loads*
- EN 1991-1-4:2005, *Eurocode 1: Actions on structures - Part 1-4: General actions - Wind actions*
- EN 1993-1-1, *Eurocode 3: Design of steel structures - Part 1-1: General rules and rules for buildings*
- EN 1993-1-6:2007, *Eurocode 3 - Design of steel structures - Part 1-6: Strength and Stability of Shell Structures*
- EN 1993-4-2, *Eurocode 3 - Design of steel structures - Part 4-2: Tanks*
- EN 10025 (all parts), *Hot rolled products of structural*
- EN 10028-2, *Flat products made of steels for pressure purposes - Part 2: Non-alloy and alloy steels with specified elevated temperature properties*
- EN 10028-3, *Flat products made of steels for pressure purposes - Part 3: Weldable fine grain steels, normalized*
- EN 10029:2010, *Hot rolled steel plates 3 mm thick or above — Tolerances on dimensions and shape*
- EN 10088-1, *Stainless steels - Part 1: List of stainless steels*
- EN 10088-2, *Stainless steels - Part 2: Technical delivery conditions for sheet/plate and strip of corrosion resisting steels for general purposes*
- EN 10088-3:2014, *Stainless steels - Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*
- EN 10164, *Steel products with improved deformation properties perpendicular to the surface of the product - Technical delivery conditions*
- EN 10204:2004, *Metallic products - Types of inspection documents*
- EN 10216 (all parts), *Seamless steel tubes for pressure purposes - Technical delivery conditions*
- EN 10217 (all parts), *Welded steel tubes for pressure purposes - Technical delivery conditions*
- EN 10222 (all parts), *Steel forgings for pressure purposes*
- EN 10250 (all parts), *Open steel die forgings for general engineering purposes*