

Specifikacija za načrtovanje in proizvodnjo na mestu postavitve grajenih navpičnih, valjastih, varjenih, jeklenih nadzemnih posod z ravnim dnom za shranjevanje tekočin pri temperaturi okolja 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-Stahl tanks für die Lagerung von Flüssigkeiten bei Umgebungstemperatur und höheren Temperaturen

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

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This draft amendment is submitted to CEN members for enquiry. It has been drawn up by the Technical Committee CEN/TC 265.

This draft amendment A1, if approved, will modify the European Standard EN 14015:2004. 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.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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EN 14015:2004/prA1:2004 (E)

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Foreword

This document (EN 14015:2004/prA1:2004) 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.

Annex S (normative)

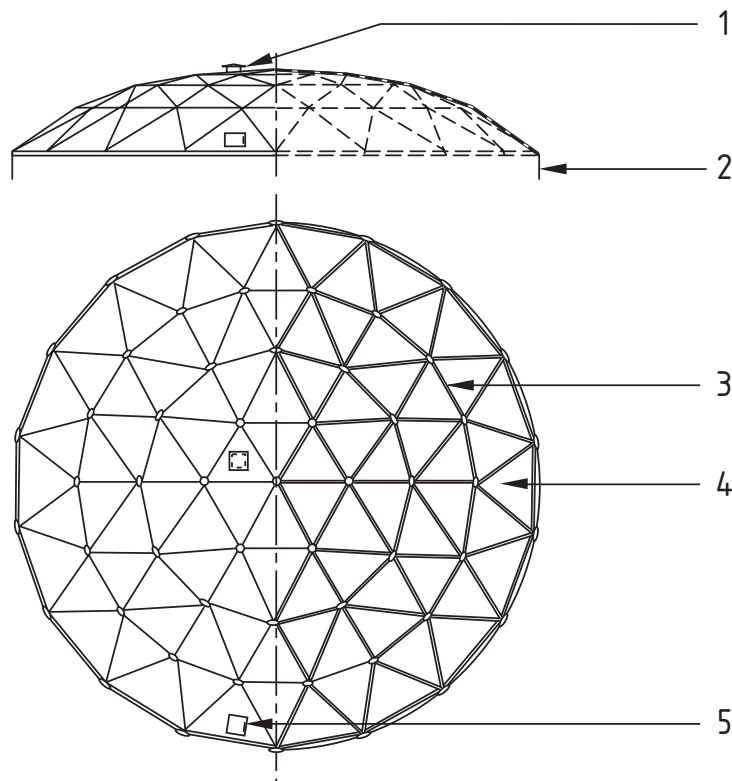
Self-supporting aluminium dome roofs for fixed roof tanks

S.1 General

This annex specifies requirements for the materials, design, erection and testing of self-supporting aluminium dome roofs for fixed roof tanks.

Self-supporting aluminium dome roofs are fabricated as three-dimensional spatially trussed structures and consist of a supporting structure, which is composed of aluminium extruded sections, jointed in the nodes by special high tensile bolted joints. The enclosed areas are covered with thin aluminium sheets, held by a clamp fastening forming a very light self-supporting roof construction with an individually designed load bearing capacity. The structure of the dome roof is attached to and supported by the tank shell at equidistant mounting points around the perimeter of the tank shell.

NOTE Self-supporting, aluminium dome roofs can be attached to new tanks and also to existing tanks.



Key

- 1 Air vent
- 2 Steel tank
- 3 Aluminium profile
- 4 Aluminium panel
- 5 Manhole

Figure S.1 — Typical aluminium dome roof on a steel tank

S.2 Design and construction requirements

S.2.1 General

When self-supporting aluminium dome roofs are specified for new tanks, the specific design of the aluminium roof shall be taken into consideration in the design of the tank as follows. The magnitude and direction of the forces acting on the tank as a result of the roof loads, together with details of the roof-to-tank shell attachments shall be supplied. In addition, stiffening rings at the top of the tank rim shall be structurally suitable for the attachment of the dome roof-bearing structure.

Existing tanks shall be checked using static calculations to determine whether the tank shell exhibits the necessary rigidity and bearing strength to support the mounting of an aluminium dome roof. The self-supporting aluminium roof, and a steel tension ring if required, shall be designed to compensate for possible tank shell irregularities and to accommodate the shape of the tank shell. The suitability of the existing rim angle and a tank shell shall be tested by a non-destructive examination (NDE) and by static calculations prepared by the customer or supplier.

S.2.2 Design loads

The roof shall be designed to accommodate the loads specified in 7.2.

S.2.3 Loading of the aluminium sheeting

The aluminium sheeting shall satisfy the following two design requirements.

1. It shall sustain a load of 3 kN/m² distributed throughout the total area of the sheet.
2. It shall sustain two concentrated loads of 1,1 kN each, over two separate areas of 0,1 m² on any sheet.

These loads shall not be considered to act simultaneously or in combination with any other loads.

S.3 Material specifications

S.3.1 General

The materials shall be compatible with the product to be stored

S.3.2 Structure and sheeting

The aluminium components used for the support structure and sheeting shall be in accordance with EN 485, EN 754 or EN 755.

S.3.3 Fasteners

High-tensile fasteners shall be used for connecting the structural components. Depending on the stress levels within the structure, aluminium, steel or stainless steel fasteners may be used. When steel fasteners are used, they shall be aluminized to provide optimum protection against corrosion.

Self-tapping stainless steel screws shall be used to attach the aluminium sheeting to the structure.

S.3.4 Gaskets

Gaskets shall be fabricated from elastomeric materials compatible with the materials of construction, the product stored and suitable for the full range of service temperatures (see 5.2.1 and 5.2.2).

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S.4 Design

S.4.1 Structure and sheeting

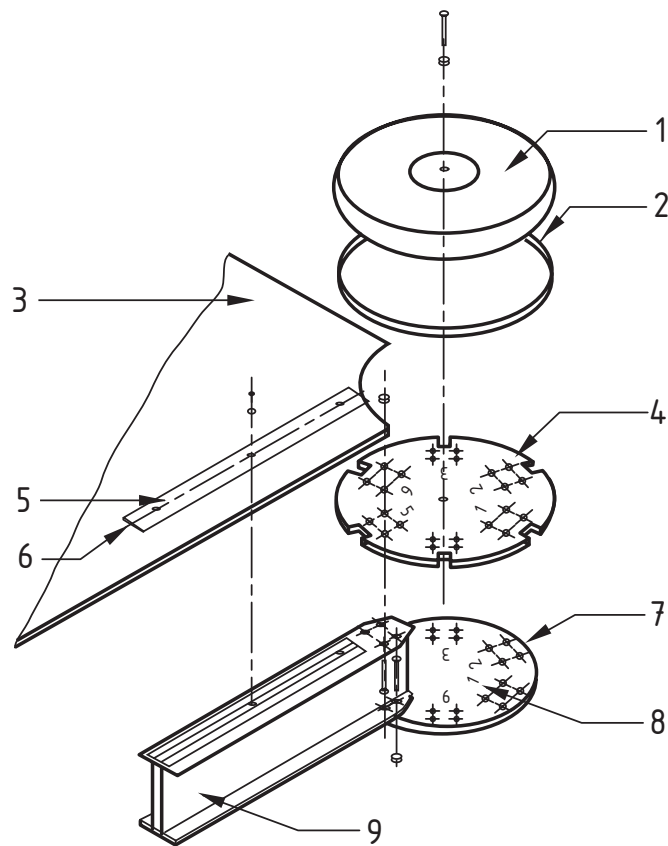
The design of the aluminium dome roof shall be in accordance with ENV 1999.

The structure of the dome roof shall be attached to and supported by the tank shell at equidistant points around the perimeter of the tank shell.

The radius of curvature of the dome shall be in accordance with 10.2.2.

The aluminium dome roof shall be constructed as a three-dimensional spatially trussed structure.

The structural members shall be aluminium profiles, which shall be connected to each other by aluminium gusset plates.



Key

1	Gusset cover	6	Seal
2	Seal	7	Bottom gusset plate
3	Cover plate	8	Number of the connecting strut
4	Top gusset plate	9	Strut
5	Clamp bar		

Figure S.2 – Assembly joint

The free spaces shall be covered with aluminium sheeting (see S.3.2).

The thickness of the aluminium sheeting shall be 1,2 mm minimum.

The thickness of the aluminium gusset plates shall be 10 mm minimum.

S.4.2 Roof to shell design

There are two basic roof-to-tank shell designs, fixed and sliding.

a) Fixed

The top of the tank shell shall be capable of taking loads in accordance with 10.5.

3. Sliding

The roof shall be designed with an integral tension ring and shall be supported on mounted bearings fitted to the top of the tank shell.

NOTE This allows sliding in a radial direction.

To prevent corrosion between the aluminium roof and a steel tank, an intermediate barrier made from PTFE, stainless steel, aluminized steel, or some other suitable material, shall be employed.

S.4.3 Sealants and gasketing

When the tank is free-vented, a gasket between the tank and the roof shall not be required. A corrosion-resistant screen to prevent the ingress of birds to the interior of the tank shall be installed where there is a gap between the roof and the tank shell.

If the tank is to be of a gas-tight design, then the method of sealing the dome roof to the tank rim shall be agreed between the purchaser and the manufacturer.

S.4.4 Earthing cables

The aluminium construction shall be earthed by an electrical connection to the steel tank. These shall be stainless steel cables with a nominal diameter of at least 5 mm and shall be arranged at every third mounting support or at intervals of about 10 m.

S.4.5 Venting

Venting shall be in accordance with 10.6.

S.5 Accessories

Where accessories are not fabricated from aluminium, an intermediate barrier such as that mentioned in S.4.2 shall be used.

The dimensions of the aluminium walkways and handrailing shall be in accordance with 13.11 and 13.12.

S.6 Erection

Erection shall be in accordance with 16.1.

S.7 Testing

S.7.1 General

A water leakage test shall be carried out after completion of the assembly.