

**Fabrikstillverkade ståltankar –**

Del 2: Horisontella, cylindriska enkel- och dubbel-  
mantlade tankar för lagring ovan jord av vatten-  
förorenade brännbara och icke brännbara vätskor

**Workshop fabricated steel tanks –**

Part 2: Horizontal cylindrical single skin and double  
skin tanks for the above ground storage of flammable  
and non-flammable water polluting liquids

Europastandarden EN 12285-2:2005 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN 12285-2:2005.

The European Standard EN 12285-2:2005 has the status of a Swedish Standard. This document contains the official English version of EN 12285-2:2005.

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## Workshop fabricated steel tanks - Part 2: Horizontal cylindrical single skin and double skin tanks for the above ground storage of flammable and non-flammable water polluting liquids

Réservoirs en aciers fabriqués en atelier - Partie 2:  
Réservoirs horizontaux à simple et double paroi pour le  
stockage aérien des liquides inflammables et non  
inflammables polluant l'eau

Werksggefertigte Tanks aus Stahl - Teil 2: Liegende  
zylindrische ein- und doppelwandige Tanks zur  
oberirdischen Lagerung von brennbaren und  
nichtbrennbaren wassergefährdenden Flüssigkeiten

This European Standard was approved by CEN on 17 December 2004.

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## EN 12285-2:2005 (E)

### Foreword

This document (EN 12285-2:2005) has been prepared by Technical Committee CEN/TC 221 “Shop fabricated metallic tanks and equipment for storage tanks and for service stations”, the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by August 2005, and conflicting national standards shall be withdrawn at the latest by November 2006.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of Construction Products Directive (CPD)<sup>1)</sup>.

For the relationship with this Directive, see informative Annex ZA, which is an integral Part of this document.

By application of this document presumption is given, that the Essential Safety Requirements of the CPD are met.

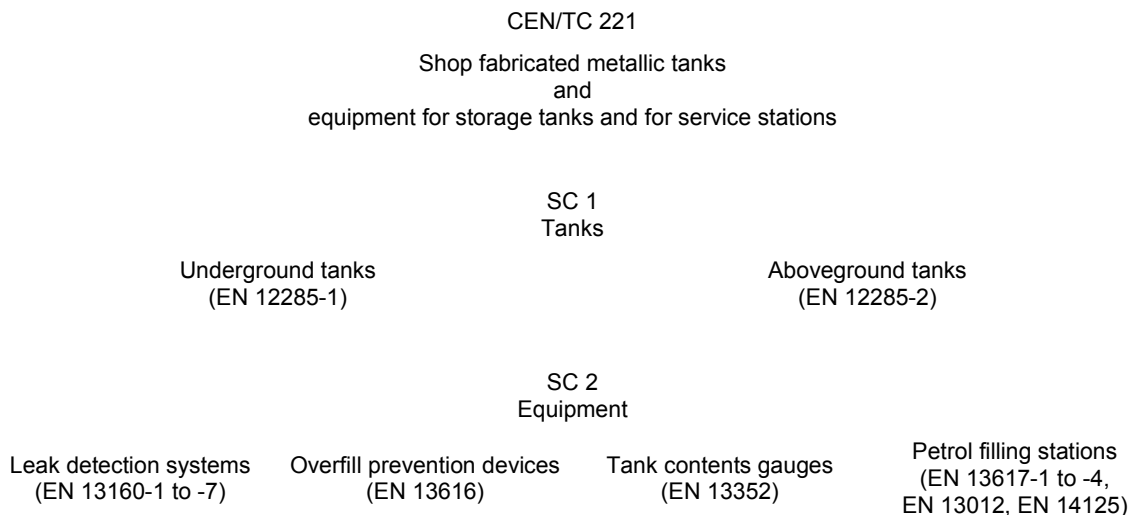
According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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1) Directive 89/106/EEC of the European Parliament and the Council of 21 December 1988 on the approximation of the laws of the Member States concerning Construction products (OJEC L 40).

## Introduction

This document is part of a family of standards involving shop fabricated tanks and equipment for storage tanks and for service stations (compare listing below and bibliography). Normal ambient temperatures considered in this document are -20 °C to +50 °C. Where temperatures are outside this range it could become necessary to consider further requirements. These could include temperature control measures or material control (see 4.2.2).



**EN 12285-2:2005 (E)**

**1 Scope**

This document specifies the requirements for metallic shop fabricated cylindrical, horizontal steel tanks, single and double skin for the aboveground storage of water polluting liquids (both flammable and non-flammable) within the following limits:

- from 800 mm up to 3 000 mm nominal diameter and,
- up to a maximum overall length of 6 times the nominal diameter and,
- for liquids with a maximum density of up to 1,9 kg/l and,
- with an operating pressure ( $P_o$ ) of maximum 1,5 bar (abs.) and,
- where double skin tanks with a vacuum leak detection system are used the cinematic viscosity of the stored media shall not exceed  $5 \times 10^{-3} \text{ m}^2/\text{s}$ .

This document is applicable for normal ambient temperature conditions (- 20 °C to + 50 °C). Where temperatures are outside this range, additional requirements need to be taken into account.

This document is not applicable for the storage of liquids having dangerous good classes listed in Table 1 because of the special dangers involved.

**Table 1 — List of dangerous goods the storage of which are not covered by this document**

UN-classification	Storage media
Class 1	Explosives
Class 4.2	Substances liable to spontaneous combustion
Class 4.3	Substances which in contact with water emit flammable gases
Class 5.2	Organic peroxides
Class 6.2	Infectious substances
Class 7	Radioactive material, hydrocyanic or hydrocyanic solvent liquids, metalcarbonyls, hydrofluoracid, bromide liquids

NOTE The classifications referred to are those adopted by the United Nations Committee of Experts on the Transport of Dangerous Goods (not to be interpreted as tank classes described in 3.1.4).

This document does not cover the installation of tanks which might be subject to local regulations involving pollution control.



## 2 Normative references

The following referenced documents are indispensable for the application 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 287-1, *Qualification test of welders — Fusion welding — Part 1: Steels*

EN 288-2, *Specification and approval of welding procedures for metallic materials — Part 2: Welding procedures specification for arc welding*

EN 10025-2, *Hot rolled products of structural steels - Part 2: Technical delivery conditions for non-alloy structural steels*

EN 10051:1991 + A1:1997, *Continuously hot-rolled uncoated plate, sheet and strip of non-alloy and alloy steels — Tolerances on dimensions and shape (includes amendment A1:1997)*

EN 10204:2004, *Metallic products — Types of inspection documents*

EN 12285-1:2003, *Workshop fabricated steel tanks — Part 1: Horizontal cylindrical single skin and double skin tanks for the underground storage of flammable and non-flammable water polluting liquids*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests*

EN ISO 898-1, *Mechanical properties of fasteners of carbon steel and alloy steel — Part 1: Bolts, screws and studs (ISO 898-1:1999)*

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials — Part 1: General rules (ISO 15607:2003)*

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 15614-1:2004)*

## 3 Terms, definitions, symbols and abbreviations

### 3.1 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

#### 3.1.1

##### **tank**

workshop fabricated cylindrical containment for the storage of liquids. It is made of steel, equipped with dished ends and consists of one or more compartments

#### 3.1.2

##### **aboveground tank**

tank which is not buried in the ground; (a tank installed in a basement is an aboveground tank)

#### 3.1.3

##### **compartment**

single storage fluid space within a tank

#### 3.1.4

##### **tank classes**

as defined in Table 2

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Table 2 — Tank classes

Tank class	Description
Class A	for liquids with density up to 1,1 kg/l
Class B	for liquids with density up to 1,9 kg/l
Class C	for liquids with density up to 1,9 kg/l and explosion pressure shockproof under atmospheric conditions (see also 3.1.5)

**3.1.5 explosion pressure shockproof tank**

tank which is designed to withstand an internal explosion without leakage; permanent deformations are permissible. Where the atmospheric pressure is 1 bar the maximum explosion pressure is measured at 10 bar (abs.)

**3.1.6 tank type**

for the purpose of this document two tank types are distinguished:

Type S: Single skin

Type D: Double skin

**3.1.7 operating pressure ( $P_o$ )**

pressure inside the tank above the liquid during operating conditions

**3.1.8 test pressure ( $P_{t1}$ )**

pressure to which the tank or compartment is subjected for testing

**3.1.9 interstitial test pressure ( $P_{t2}$ )**

pressure to which the interstitial space between the skins is subjected for testing. It is only applicable for double skin tanks

**3.1.10 nominal volume**

storage capacity for which the tank is sold

**3.1.11 actual volume**

total internal capacity of the tank which is equal to or greater than the nominal volume

NOTE The safe working capacity of the tank should normally not exceed 95 % of the nominal volume for mineral oil products. For other liquids the safe working capacity conforms to Equation (1).

$$f = \frac{100}{1 + 35\delta} \tag{1}$$

where

- $f$  is the percentage of nominal volume (%);
- $\delta$  is the thermal expansion coefficient of the liquid (K).

### 3.2 Symbols and abbreviations

For the purpose of this document, the following symbols apply.

Dimensions in mm

- $a$  Weld thickness
- $b_1$  Width of the saddle
- $b_2$  Width of compensation plate
- $d_1$  External nominal diameter of the tank
- $d_2$  Inside diameter of the manhole
- $d_3$  Diameter of the manhole cover
- $e_1$  Distance between centre of the saddle and the end of the cylindrical part of the tank
- $h_1$  Length of the straight flange of the dished end
- $k_1$  Length of the saddle base
- $k_p$  Pitch circle diameter of manway bolts
- $l_c$  Length of the compartment of a tank without dished ends
- $l_o$  Overall length of the tank
- $l_z$  Length of the tank without dished ends
- $n_1$  Distance of the saddle foot to the bottom of the tank
- $r_1$  Crown radius of dished ends
- $r_2$  Knuckle radius of dished ends
- $r_3$  Knuckle radius of the outer dished end
- $s_1$  Nominal thickness of inner skin and inner dished ends
- $s_2$  Interstitial space
- $s_3$  Nominal thickness of outer skin
- $s_4$  Nominal thickness of outer dished ends
- $s_5$  Nominal thickness of compartment dished ends
- $s_6$  Nominal thickness of manhole flange and cover
- $s_7$  Plate thickness of manhole body