

>Y`Yb]fYnYfj cUf]ž]nXYUb]j`XYUj b]W]Ē`&`XY.`JcXcfUj b]j`U`Ugh]Ybcd`Uý b]`]b
Xj cd`Uý b]fYnYfj cUf]bUXnYa bY]nj YXVY`nU[cf`]j Y]b`bY[cf`]j Y`h`c]bYž`_]
cbYgbUyi`Y`c`j`cXc

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

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

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 12285-2:2005](https://standards.iteh.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-2005)

<https://standards.iteh.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-2005>

Ta slovenski standard je istoveten z: EN 12285-2:2005

ICS:

13.300	Varstvo pred nevarnimi izdelki	Protection against dangerous goods
23.020.10	Stacionarna posoda in rezervoarji	Stationary containers and tanks

SIST EN 12285-2:2005 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12285-2:2005

<https://standards.iteh.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-dc5eb3a7daed/sist-en-12285-2-2005>

ICS 23.020.10

English version

Workshop fabricated steel tanks - Part 2: Horizontal cylindrical
single skin and double skin tanks for the aboveground 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

Werksgefertigte 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.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists 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 Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of 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.



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

Management Centre: rue de Stassart, 36 B-1050 Brussels

Contents

	Page
Foreword.....	4
Introduction	5
1 Scope	6
2 Normative references	7
3 Terms, definitions, symbols and abbreviations	7
3.1 Terms and definitions	7
3.2 Symbols and abbreviations	9
4 Requirements	11
4.1 Designation and purchaser's specification	11
4.2 Materials	11
4.3 Design	12
4.4 Tolerances	14
4.5 Shell plate arrangement	14
4.6 Manholes and inspection covers	14
4.7 Structural bolts	16
4.8 Tank fittings, pipes and nozzles	16
4.9 Saddles, supports	16
4.10 Lifting lugs	18
4.11 Fabrication	18
4.12 Dangerous substances	21
4.13 Reaction to fire	21
4.14 Durability	21
5 Testing assessment and sampling methods	21
6 Evaluation of conformity	21
6.1 General	21
6.2 Type testing	22
6.3 Factory production control (FPC)	23
7 Handling and installation	24
7.1 Handling	24
7.2 Installation	24
8 Marking and labelling of the tank	24
8.1 Marking of the tank	24
8.2 Tank certificate	25
8.3 Documentation	25
Annex ZA (informative) Clauses of this European Standard addressing the provisions of the EU Construction Products Directive	26
ZA.1 Scope and relevant characteristics	26
ZA.2 Procedure(s) for the attestation of conformity of steel tanks	27
ZA.3 CE marking and labelling	29
Bibliography	32

Figures

Figure 1 — Example of double skin aboveground tank, symbols.....	10
Figure 2 — Shell plate arrangement for inner and outer skin.....	14
Figure 3 — Examples for manholes.....	15
Figure 4 — Example for a saddle support arrangement.....	16
Figure 5 — Example for marking	24
Figure ZA.1 — Example CE marking information for a system 3 product.....	31

Tables

Table 1 — List of dangerous goods the storage of which are not covered by this document	6
Table 2 — Tank classes	8
Table 3 — Nominal wall thickness for inner and outer skin tanks, dished ends and compartment dished end.....	13
Table 4 — Dimensions of manhole components.....	15
Table 5 — Dimensions of welded saddles	17
Table 6 — Dimensions of saddle components.....	17
Table 7 — Loose saddles.....	17
Table 8 — Types of welded joints	19
Table 9 — Test pressure P_{t1} and P_{t2}	21
Table 10 — Number of units and compliance criteria for initial and further testing	22
Table 11 — Minimum frequency of testing for product testing and evaluation as part of FPC	23
Table ZA.1 — Relevant clauses.....	27
Table ZA.2 — Attestation of conformity systems.....	27
Table ZA.3a — Assignment of evaluation of conformity tasks (for system 3).....	28
Table ZA.3b — Assignment of evaluation of conformity tasks (for system 4).....	28

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)¹⁾.

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12285-2:2005

<https://standards.iteh.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-dc5eb3a7daed/sist-en-12285-2-2005>

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).

CEN/TC 221

Shop fabricated metallic tanks
and
equipment for storage tanks and for service stations

SC 1
Tanks

Underground tanks
(EN 12285-1)

Aboveground tanks
(EN 12285-2)

SC 2
Equipment

Leak detection systems
(EN 13160-1 to -7)

Overfill prevention devices
(EN 13616)

Tank contents gauges
(EN 13352)

Petrol filling stations
(EN 13617-1 to -4,
EN 13012, EN 14125)

SIST EN 12285-2:2005

<https://standards.iteh.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-dc5eb3a7daed/sist-en-12285-2-2005>

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_0) 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)*

<https://standards.iteh.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-dc5eb3a7daed/sist-en-12285-2-2005>

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

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

iTeh STANDARD PREVIEW
(standard.iTech.ai)

3.1.8

test pressure (P_{t1})

pressure to which the tank or compartment is subjected for testing

SIST EN 12285-2:2005
<https://standards.iTech.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-dc5eb3a7daed/sist-en-12285-2-2005>

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 (%);
- δ 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

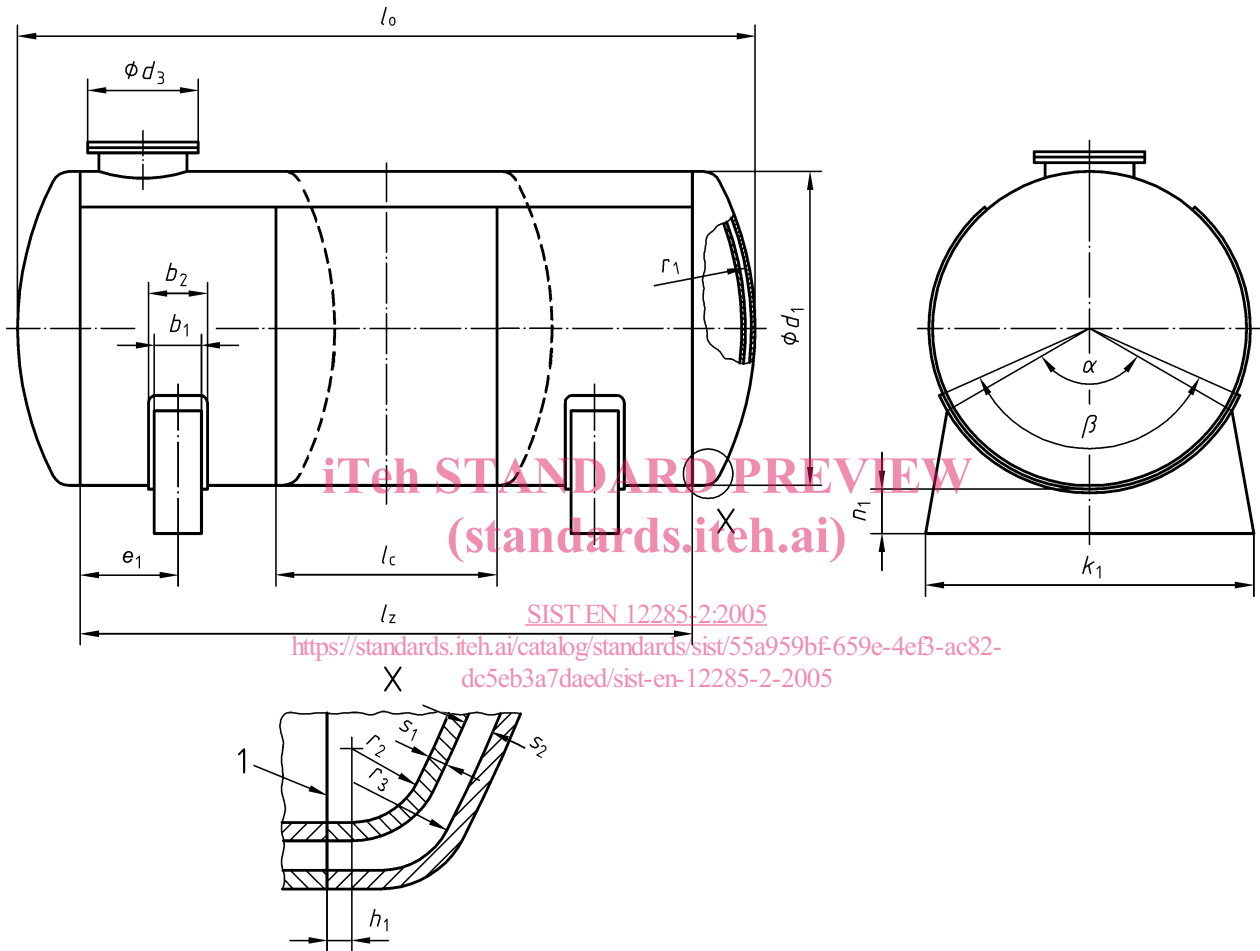
iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 12285-2:2005

<https://standards.iteh.ai/catalog/standards/sist/55a959bf-659e-4ef3-ac82-dc5eb3a7daed/sist-en-12285-2-2005>

- α Angle of the saddle
- β Angle of the compensation plate
- γ Incline angle for T-joint welding

- δ Thermal expansion coefficient of the liquid



Key

- 1 Weld

Figure 1 — Example of double skin aboveground tank, symbols