

norm**NEN-EN 14025**

Tanks voor transport van gevaarlijke
goederen - Metalen druktanks -
Ontwerp en constructie

Publicatie uitsluitend voor commentaar

Tanks for transport of dangerous goods - Metallic pressure tanks -
Design and construction

november 2000
ICS 55.140

Commentaar voor 2001-03-15

Als Europees normontwerp is gepubliceerd: prEN 14025:2000, IDT

Definitief vastgestelde normen zullen als Nederlandse norm gelden. Daarom wordt dit normontwerp in Nederland voor commentaar gepubliceerd. Op het ontwerp ingebracht commentaar zal aan de bevoegde normcommissie worden voorgelegd die hiermee rekening zal houden bij de bepaling van de Nederlandse stem. Indien er geen bezwaar bij het NNI wordt ingebracht, kan dat leiden tot ongewijzigd definitieve vaststelling van het ontwerp als norm.

Van Europese normen bestaan drie officiële versies: Engels, Frans en Duits. Voor Nederland zal de Engelse versie gelden, tenzij voor een geautoriseerde versie in het Nederlands wordt gekozen.

Normcommissie 345 069 "Vervoer van gevaarlijke stoffen"

Apart from exceptions provided by the law, nothing from this publication may be duplicated and/or published by means of photocopy, microfilm, storage in computer files or otherwise, which also applies to full or partial processing, without the written consent of the Netherlands Standardization Institute.

The Netherlands Standardization Institute shall, with the exclusion of any other beneficiary, collect payments owed by third parties for duplication and/or act in and out of law, where this authority is not transferred or falls by right to the Reproduction Rights Foundation.

Auteursrecht voorbehouden. Behoudens uitzondering door de wet gesteld mag zonder schriftelijke toestemming van het Nederlands Normalisatie-instituut niets uit deze uitgave worden veeleenvoudigd en/of openbaar gemaakt door middel van fotokopie, microfilm, opslag in computerbestanden of anderszins, hetgeen ook van toepassing is op gehele of gedeeltelijke bewerking.

Het Nederlands Normalisatie-instituut is met uitsluiting van ieder ander gerechtigd de door derden verschuldigde vergoedingen voor veeleenvoudiging te innen en/of daartoe in en buiten rechte op te treden, voor zover deze bevoegdheid niet is overgedragen c.q. rechtens toekomt aan de Stichting Reprorecht.

Although the utmost care has been taken with this publication, errors and omissions cannot be entirely excluded. The Netherlands Standardization Institute and/or the members of the committees therefore accept no liability, not even for direct or indirect damage, occurring due to or in relation with the application of publications issued by the Netherlands Standardization Institute.

Hoewel bij deze uitgave de uiterste zorg is nagestreefd, kunnen fouten en onvolledigheden niet geheel worden uitgesloten. Het Nederlands Normalisatie-instituut en/of de leden van de commissies aanvaarden derhalve geen enkele aansprakelijkheid, ook niet voor directe of indirecte schade, ontstaan door of verband houdend met toepassing van door het Nederlands Normalisatie-instituut gepubliceerde uitgaven.

Dit document mag slechts op een stand-alone PC worden geïnstalleerd. Gebruik op een netwerk is alleen toegestaan als een aanvullende licentieovereenkomst voor netwerkgebruik met NEN is afgesloten. This document may only be used on a stand-alone PC. Use in a network is only permitted when a supplementary license agreement for us in a network with NEN has been concluded.

Voorbeeld
Preview

ICS

English version

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

Citernes destinées au transport de matières dangereuses -
Citernes métalliques sous pression - Conception et
fabrication

Tanks für die Beförderung gefährlicher Güter - Metallische
Drucktanks - Auslegung und Bau

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

If this draft becomes a European Standard, 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.

This draft European Standard 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 Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.



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

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

Contents

	Page	Page
Foreword	3	
1 Scope	3	
2 Normative references	3	
3 Definition and Symbols	4	
3.1 Definition	4	
3.2 Symbols	5	
3.2.1 Symbols used in the main text	5	
3.2.2 Symbols used in Annex A	5	
4 Materials	5	
4.1 General	5	
4.2 Compatibility	5	
5 Design	6	
5.1 General	6	
5.2 Reduction of shell thickness	6	
5.3 Protection of the shell	6	
6 Calculation	6	
6.1 Design criteria	6	
6.2 Calculation for internal pressure	7	
6.2.1 General	7	
6.2.2 Wall thickness of the cylindrical section	7	
6.2.3 Wall thickness of ends	7	
6.2.4 Wallthickness of conical sections	11	
6.2.5 Openings and reinforcement	13	
6.2.6 Flanges, joints, bolts	24	
6.3 Calculation for external pressure	25	
6.3.1 Cylindrical and conical sections	25	
6.3.2 Elastic buckling	26	
6.3.3 Plastic deformation	27	
6.3.4 Stiffeners	27	
6.3.5 Ends	27	
6.4 Tank to frame connection/interface	28	
7 Construction and Manufacturing	29	
7.1 General Requirements	29	
7.2 Cutting	29	
7.3 Forming	29	
7.3.1 General	29	
7.3.2 Cold Forming	29	
7.3.3 Hot Forming	30	
7.3.4 Ends	30	
7.3.5 Heat Treatment and Normalising	30	
7.4 Welding	30	
7.4.1 Qualification	30	
7.4.2 Welded joints	30	
7.4.3 Non-destructive testing (λ)	31	
7.4.4 Temporary attachments	31	
7.5 Manufacturing tolerances	32	
7.5.1 Plate alignment	32	
7.5.2 Defects of form	32	
7.5.3 Thickness	32	
7.5.4 Dished ends	33	
7.5.5 Cylindrical Sections	33	
8 Repairs	33	
8.1 General	33	
8.2 Repair of surface defects in the parent metal	33	
8.3 Repair of weld defects	33	
Annex A (informative) RID/ADR references ..	34	
Annex B (informative) Sample calculation ..	43	

Foreword

This Draft European Standard has been prepared by Working Group 3 "Metallic pressure tanks" (secretariat DIN) of the Technical Committee CEN/TC 296 "Tanks for the transport of dangerous goods" of which the secretariat is held by AFNOR.

This Draft European Standard has been prepared under a mandate given to CEN by the European Commission and supports the objectives of the framework Directives on Transport of Dangerous Goods.

The final standard will be submitted for reference into the RID and/or in the technical annexes of the ADR.

Therefore the standards listed in the normative references and covering basic requirements of the RID/ADR not addressed within the present standard are normative only when the standards themselves are referred to in the RID and/or in the technical annexes of the ADR.

1 Scope

This European Standard specifies the minimum requirements for the design and construction of metallic pressure tanks for the transport of dangerous goods by road, rail and on inland waterways. This standard includes requirements for openings, closures and structural equipment; it does not cover requirements of service equipment. For tanks for the transport of LPG see prEN 12493, for those of cryogenic liquids see prEN 13530-1, 2 and 3.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

prEN 1591

Flanges and their joints – Design rules for gasketed circular flange connections – Calculation method

prEN 1708-1

Welding – Basic weld joint details in steel – Part 1: Pressurized components

prEN 12285

Metallic workshop fabricated tanks – Horizontal single skin and double skin tanks for the underground storage of flammable and non-flammable water polluting liquids

prEN 12493

Design and manufacture of welded steel tanks for LPG road tankers

prEN 12972

Tanks for transport of dangerous goods – Testing, inspection and marking of metallic tanks

prEN 13094

Tanks for transport of dangerous goods – Non-pressure metallic tanks – Design and construction

prEN 13530-1

Cryogenic vessels – Large transportable vacuum insulated vessels – Part 1: Fundamental requirements

prEN 13530-2

Cryogenic vessels – Large transportable vacuum insulated vessels – Part 2: Design, fabrication, inspection and testing (fixed tank (tank vehicles) and demountable tanks)

prEN 13530-3

Cryogenic vessels – Large transportable vacuum insulated vessels – Part 3: Operational requirements

EN 287-1

Approval testing of welders; Fusion welding – Part 1: Steels

EN 287-2

Approval testing of welders; Fusion welding – Part 2: Aluminium and aluminium alloys

EN 288-1

Specification and qualification of welding procedures for metallic materials – Part 1: General rules for fusion welding

EN 288-2

Specification and approval of welding procedures for metallic materials – Part 2: Welding procedure specification for arc welding

EN 288-3

Specification and approval of welding procedures for metallic materials – Part 3: Welding procedure tests for the arc welding of steels

EN 288-4

Specification and approval of welding procedures for metallic materials – Part 4: Welding procedure tests for the arc welding of aluminium and its alloys

EN 288-8

Specification and approval of welding procedures for metallic materials – Part 8: Approval by a pre-production welding test

EN 473

General principles for qualification and certification of NDT personnel

EN 729-1

Quality requirements for welding - Fusion welding of metallic materials – Part 1: Guidelines for selection and use

EN 729-2

Quality requirements for welding – Fusion welding of metallic materials – Part 2: Comprehensive quality requirements

EN 729-3

Quality requirements for welding – Fusion welding of metallic materials – Part 3: Standard quality requirements

EN 970

Visual testing

EN 1435

Non-destructive examination of welds – Radiographic examination of welded joints.

EN 1714

Non-destructive examination of welds – Ultrasonic examination of welded joints.

EN 12561-6

Bahnwendungen – Kesselwagen – Teil 6: Mannloch

EN 25817

Arc welded joints in steel. Guidance on quality levels for imperfections

EN 30042

Arc welded joints in aluminium and its weldable alloys. Guidance on quality levels for imperfections.

EN ISO 9000-1

Quality management and quality assurance standards – Part 1: Guidelines for selection and use

EN ISO 9000-3

Quality management and quality assurance standards – Part 3: Guidelines for the application of ISO 9001 : 1994 to the development, supply, installation and maintenance of computer software

ISO 1496-3

Series 1 freight containers – Specification and testing – Part 3: Tank containers for liquids, gases and pressurized dry bulk

ISO 7005-1

Metallic flanges – Part 1: Steel flanges

ISO 7005-2

Metallic flanges – Part 2: Cast iron flanges

ISO 7005-3

Metallic flanges – Part 3: Copper alloy and composite flanges

ISO 9663 Amd 1

Series 1 freight containers; interface connections for tank containers; amendment 1: sections 3 and 4

3 Definition and Symbols

3.1 Definition

For the purpose of this standard the term "pressure-tank" means a tank as defined in the international regulations for the transport of dangerous goods having a maximum allowable working pressure exceeding 0,5 bar.

3.2 Symbols

3.2.1 Symbols used in the main text

The following general symbols are used throughout the text; they are listed in alphabetical order. Special symbols are explained with the relevant formula.

d_i	inside diameter of an opening
D_C	meandiameter of the cylindrical part of the tank at the junction of a cone
D_e	outside diameter of the cylindrical part of the tank
D_i	inside diameter of the cylindrical part of the tank or the straight flange of dished end
e	minimum required wall thickness (in mm) of the tank
e_k	wall thickness of a conical part of a tank
e_R	wall thickness of a hemispherical end
E	Young's modulus
f_d	nominal design stress (allowable stress)
h	inside height of an ellipsoidal dished end
p	design pressure, in MPa
p_{test}	test pressure, in MPa
p_{vap}	vapour pressure at 50 °C
r	inner knuckle radius, in mm
R	inside spherical radius of the central part of a torispherical end
R_e	guaranteed minimum yield strength, in N/mm ² or guaranteed minimum 0,2 % proof strength in N/mm ² (for austenitic steel the 1 % proof strength may be chosen)
R_m	guaranteed minimum tensile strength, in N/mm ²
β	shape factor depending on form of end
λ_s	welding coefficient

3.2.2 Symbols used in Annex A

A_1	minimum elongation of the metal chosen on fracture under tensile stress, in per cent
e_0	minimum required wall thickness, in mm, of cylindrical part of shells together with ends and cover plates in "reference mild steel" (depending on diameter and additional protection)
e_1	equivalent wall thickness, in mm, for shells of a different metal than the "reference mild steel"
D	internal diameter of shell in mm
P_T	test pressure in MPa
P_C	calculation pressure in MPa
R_e	the apparent yield strength, or 0,2 % or, in the case of austenitic steels, 1 % proof strength
R_m	minimum tensile strength
R_{m1}	minimum tensile strength of the metal chosen, in N/mm ²
λ	a coefficient not exceeding or equal to 1, allowing for any weakening due to welds
σ	permissible stress in N/mm ²

4 Materials

4.1 General

The tank shell shall be fabricated from metallic materials which shall be resistant to brittle fracture and of adequate impact strength within the design temperature range. The material shall be suitable for shaping.

Welded shells shall be fabricated from a material which has been shown to have acceptable welding characteristics.

4.2 Compatibility

The materials of shells or of their protective linings which are in contact with the contents shall not contain substances liable to react dangerously with the contents, to form dangerous compounds, or substantially to weaken the material (e. g. by stress corrosion cracking).

Guidelines on material specifications in relation to the substances to be transported may be taken from Annex A of prEN 12285 : 1996.

5 Design

5.1 General

Shells, their attachments and their service and structural equipment shall be designed to withstand without loss of contents the

- 1.) Operating conditions including static and dynamic forces in normal conditions of carriage
- 2.) Test conditions

under consideration of 6.

NOTE: The requirements coming from the relevant regulations (i. e. RID and ADR) are given in Annex A for information.

5.2 Reduction of shell thickness

Minimum wall thickness of shells conforming to A.2.8 are allowed to be reduced by a maximum of 2 mm in the case of mild steel or of equivalent thicknesses of another metal, if protection of the shell against damage through lateral impact or overturning is provided (see A.2.9). Whatever the metal and protection used, the wall thicknesses of the shells shall be in no case less than 3 mm.

For shells of rail tank wagons no reduction of the minimum wall thickness due to protection is allowed.

5.3 Protection of the shell

Shells of tank containers are protected against damage if one of the following measures is provided:

- a structure, in which the shell is supported by a complete skeleton including longitudinal and transverse structural members. This structure shall conform to the requirements of ISO 1496-3;
- a double wall construction, where the aggregate thickness of the outer metal wall and the shell wall itself is not less than the minimum wall thickness prescribed in A.2.8 for reduced wall thickness;
- a "sandwich" construction, which means shells made with double walls having an intermediate layer of rigid solid materials (e. g. foam, at least 50 mm thick), where the outer wall has a thickness of at least 0,5 mm of steel, 0,8 mm of aluminium or 2 mm of a plastics material reinforced with glass fibre. For other layer materials (e.g. mineral wool, at least 100 mm thick), the outer wall has a thickness of at least 0,8 mm of austenitic steel. Other combinations of materials used to provide protection against damage shall be shown to have equivalent strength to the minimum thickness required in accordance with A.2.8. One method of comparing the strength of sheets of materials is given in Annex C of prEN 13094 : 1997.

For shells of road tankers see also 5.4.1.2 of prEN 13094 : 1997.

6 Calculation

6.1 Design criteria

Design criteria (loads, allowable stresses and design temperature) to be applied shall be taken from Table 1.

Table 1: Design criteria

	Operating conditions	Test conditions
p	MAWP *)	p_{test} ***)
	$p_{vap} + p_{dyn}$ **) [if applicable]	
f_d	$\min \{ R_e / 1,5 ; R_m / 2,4 \}$	$\min \{ 0,75 R_e ; 0,5 R_m \}$ ***)
Design temperature	20°C provided that the operating temperature of the tank is within the range -20°C to +50°C. When the operating temperature is outside this range then the design temperature shall be taken as the extreme value of the operating temperature.	Temperature at the pressure test (normally +20 °C).
*) MAWP is the maximum allowable working pressure		
**) The dynamic forces may be taken into account by introducing an equivalent dynamic pressure p_{dyn} determined on the basis of the dynamic forces specified in the relevant regulations (see Annex A) but not less than 0,35 bar.		
***) To be taken from the relevant regulation , (see also Annex A)		

6.2 Calculation for internal pressure

6.2.1 General

The thickness of the cylindrical section of the shell shall be determined in accordance with 6.2.2. The thickness of the ends of the shell shall be determined in accordance with 6.2.3. The thickness of a conical section and the reinforcement of the cone to cylinder junction shall be determined in accordance with 6.2.4. For flanges, joints and their bolts see 6.2.6.

Openings in the shell shall be designed in accordance with 6.2.5.

6.2.2 Wall thickness of the cylindrical section

The wall thickness shall not be less than the value given by the following equation.

$$e = \frac{p D_i}{2 f_d \cdot \lambda_s - p} \quad (1)$$

6.2.3 Wall thickness of ends

6.2.3.1 General

The thickness of the ends, subject to the limitations in 6.2.3.2, shall not be less than that given by 6.2.3.3 and 6.2.3.4, 6.2.3.5 or 6.2.3.6 as applicable.

6.2.3.2 Design limitations

The following design limitations shall apply to the tank ends

- (a) Hemispherical ends $0,001 D_e \leq e \leq 0,16 D_e$
- (b) Torispherical ends $0,001 D_e \leq e \leq 0,08 D_e$
 $0,06 D_i \leq r \leq 0,2 D_i$
 $r \geq 2 e$
 $R \leq D_e$
- (c) Ellipsoidal ends $0,001 D_i \leq e \leq 0,08 D_i$
 $3,4 \leq D_i/h \leq 4,4$

The four relationships in (b) and the two relationships in (c) shall be simultaneously fulfilled.

6.2.3.3 Thickness of the flange of the end

The wall thickness of the cylindrical or straight flange of the end shall not be less than the thickness as determined in accordance with 6.2.2 for a cylindrical section having the same inside diameter D_i .

6.2.3.4 Thickness of hemispherical ends

The thickness of a hemispherical end shall be not less than that determined by the following equation

$$e_R = \frac{p \cdot D_i}{4 f_d \cdot \lambda_S - p} \quad (2)$$

6.2.3.5 Thickness of torispherical ends

6.2.3.5.1 General

The minimum thickness of torispherical ends shall be the greatest of the values of e_y , e_s , or e_b as determined by equations (3) to (5).

$$e_y = \beta_e \frac{p (0,75 R + 0,2 D_i)}{f_d} \quad (3)$$

where β_e is calculated from formulae (6) to (14)

$$e_s = \frac{p R}{2 f_d \lambda_S - 0,5 p} \quad (4)$$

$$e_b = (0,75 R + 0,2 D_i) \left(\frac{p}{111 f_d} \left(\frac{D_i}{r} \right)^{0,825} \left(\frac{2}{3} \right) \right) \quad (5)$$

If ends are manufactured from several elements independent of the extent of tests the welding coefficient λ_S may be taken equal to 1,0 if the weld crosses the crown area of $0,6 D_e$ (see figure 1), otherwise see clause 7.4.3.

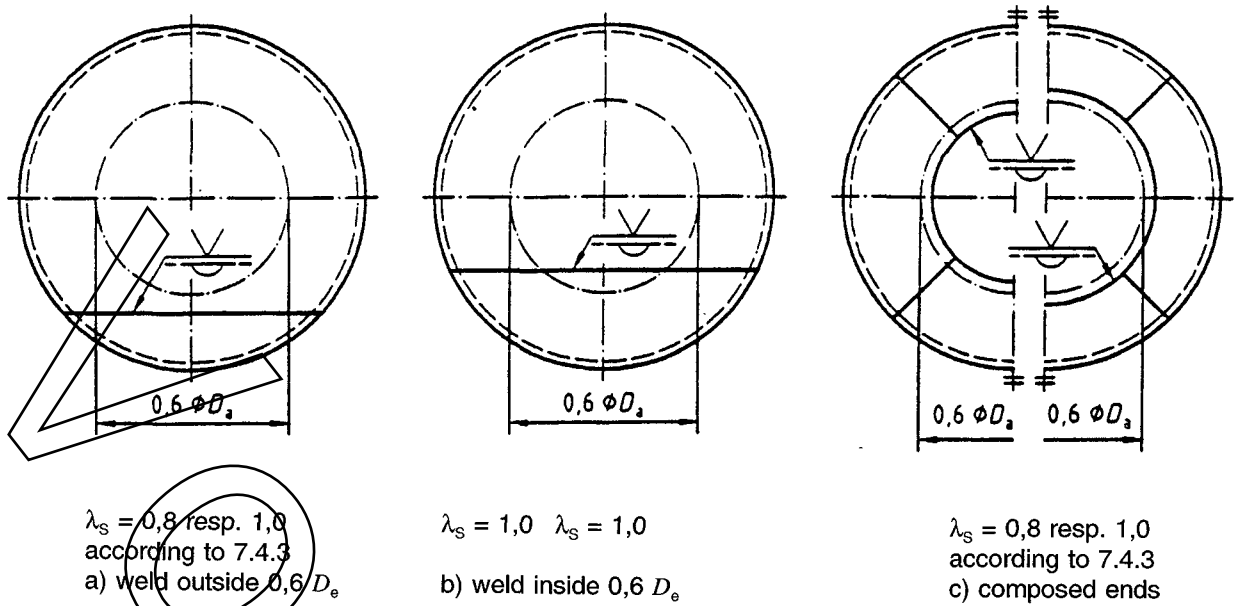


Figure 1: Position of welds in ends

6.2.3.5.2 Formulae for calculation of β_e

$$Y = \min (e/R ; 0,04) \quad (6)$$

$$Z = \log (1/Y) \quad (7)$$

$$X = r/D_1 \quad (8)$$

$$N = 1,006 - \frac{1,90 Y^4}{6,2 + 1,90 Y^4} \quad (9)$$

For $X = 0,06$:

$$\beta_{e,0,06} = N (-0,3635 Z^3 + 2,2124 Z^2 - 3,2937 Z + 1,8873) \quad (10)$$

For $0,06 < X < 0,1$:

$$\beta_e = 25[(0,1-X)\beta_{e,0,06} + (X-0,06)\beta_{e,0,1}] \quad (11)$$

For $X = 0,1$:

$$\beta_{e,0,1} = N (-0,1833 Z^3 + 1,0383 Z^2 - 1,2943 Z + 0,837) \quad (12)$$

For $0,1 < X < 0,2$:

$$\beta_e = 10[(0,2-X)\beta_{e,0,1} + (X-0,1)\beta_{e,0,2}] \quad (13)$$

For $X = 0,2$:

$$\beta_{e,0,2} = \max \{ 0,95(0,56 - 1,94 Y - 82,5 Y^2) ; 0,5 \} \quad (14)$$

6.2.3.5.3 Openings within the knuckle area of Kloepper- and Korbboegen-type ends

6.2.3.5.3.1 In this clause rules are given for increasing the thickness of a dished end to compensate for branches within the knuckle area.

The rules are limited in application to Kloepper- and Korbboegen-type ends for which

a) $d_1 / D_o \leq 0,6$ (15)

b) $\frac{d_1}{\sqrt{6} D_o} \leq 6,7$ (16)

The orientation of the branch shall be such that the centre-line of the branch lies in the same plane as the centre-line of the shell. The branch centre-line shall lie between normal to the nominal shape of the end and parallel to the shell centre-line. The location of the branch shall be such that it does not cross the tangent line between knuckle and cylinder. Branches parallel to the shell centre-line and with the outside diameter in line with the outside diameter of the shell are included in these rules.

The increased thickness required by this clause applies to the whole knuckle area. Welded-on compensation is not permitted.

6.2.3.5.3.2 Determine β_k from the procedure in Table 2.

Replace p by $\beta_k p$ in equation (3) to arrive at the required thickness. Equations (4) and (5) continue and apply without modification.

Table 2: Procedure for calculation of weakening factor β_k for openings in the knuckle region (design)

Step	Kloepper type end	Korbboegen type end
1	$V = \log \left(1000 \frac{p}{f_d} \right)$	$V = \log \left(1000 \frac{p}{f_d} \right)$
2	$A = \max (0,5; 0,264 + 0,925 V - 0,592 V^2 + 0,14 V^3)$	$A = 0,54 + 0,41 V - 0,044 V^3$
3	$B = \min (4,2; 4,91 - 2,165 V + 0,151 V^2)$	$B = 7,77 - 4,53 V + 0,744 V^2$
4	$\beta_k = \max \left(A + B \frac{d_1}{D_o}; 1 + 0,3 \frac{d_1}{D_o} \right)$	$\beta_k = \max \left(A + B \frac{d_1}{D_o}; 1 + 0,5 \frac{d_1}{D_o} \right)$

6.2.3.6 Thickness of ellipsoidal ends

An ellipsoidal end is an end that is made on a former that has a true ellipsoidal shape. Ellipsoidal ends shall have a shape factor K with a value between 1,7 and 2,2.

$$K = \frac{D_1}{2h} \quad (17)$$

Ellipsoidal ends shall be designed as torispherical ends in accordance with 6.2.3.5 with the values of r and R as given by the following:

$$r = \left(\frac{0,5}{K} - 0,08 \right) D_1 \quad (18)$$

$$R = (0,44 K + 0,02) D_1 \quad (19)$$

Bestelformulier

NEN

Stuur naar:

NEN Standards Products & Services
t.a.v. afdeling Klantenservice
Antwoordnummer 10214
2600 WB Delft

NEN Standards Products & Services

Postbus 5059
2600 GB Delft

Vlinderweg 6
2623 AX Delft

T (015) 2 690 390
F (015) 2 690 271

www.nen.nl/normshop

Ja, ik bestel

__ ex. NEN-EN 14025:2000 Ontw. en Tanks voor transport van gevaarlijke goederen - Metalen druktanks - Ontwerp en constructie € 41.00

Wilt u deze norm in PDF-formaat? Deze bestelt u eenvoudig via www.nen.nl/normshop

Gratis e-mailnieuwsbrieven

Wilt u op de hoogte blijven van de laatste ontwikkelingen op het gebied van normen, normalisatie en regelgeving? Neem dan een gratis abonnement op een van onze e-mailnieuwsbrieven. www.nen.nl/nieuwsbrieven

Retourneren

Fax: (015) 2 690 271
E-mail: klantenservice@nen.nl
Post: NEN Standards Products & Services,
t.a.v. afdeling Klantenservice
Antwoordnummer 10214,
2600 WB Delft
(geen postzegel nodig).

Gegevens

Bedrijf / Instelling

T.a.v. O M O V

E-mail

Klantnummer NEN

Uw ordernummer BTW nummer

Postbus / Adres

Postcode Plaats

Telefoon Fax

Factuuradres (indien dit afwijkt van bovenstaand adres)

Postbus / Adres

Postcode Plaats

Datum Handtekening

Voorwaarden

- De prijzen zijn geldig tot 31 december 2016, tenzij anders aangegeven.
- Alle prijzen zijn excl. btw, verzend- en handelingskosten en onder voorbehoud bij o.m. ISO- en IEC-normen.
- Bestelt u via de normshop een pdf, dan betaalt u geen handeling en verzendkosten.
- Meer informatie: telefoon (015) 2 690 391, dagelijks van 8.30 tot 17.00 uur.
- Wijzigingen en typfouten in teksten en prijsinformatie voorbehouden.
- U kunt onze algemene voorwaarden terugvinden op: www.nen.nl/leveringsvoorwaarden.