SLOVENSKI STANDARD
oSIST prEN 14433:2013

01-julij-2013

Posode za prevoz nevarnih snovi - Oprema posode za prevoz tekočih kemikalij in utekočinjenih plinov - Izpustni ventili

Tanks for the transport of dangerous goods - Tank equipment for the transport of liquid chemicals and liquefied gases - Foot valves

Tanks für die Beförderung gefährlicher Güter - Ausrüstung für Tanks für die Beförderung von flüssiger Chemieprodukte und Flüssiggase - Bodenventile

Citernes de transport de matières dangereuses - Équipements de la citerne pour le transport de produits chimiques liquides et de gaz liquéfiés - Clapets de fond

Ta slovenski standard je istoveten z: prEN 14433

ICS:

13.300	Varstvo pred nevarnimi izdelki	Protection against dangerous goods
23.020.20	Posode in vsebniki, montirani na vozila	Vessels and containers mounted on vehicles

oSIST prEN 14433:2013 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

DRAFT
prEN 14433

February 2013

ICS 13.300; 23.020.20

Will supersede EN 14433:2006

English Version

Tanks for the transport of dangerous goods - Tank equipment for the transport of liquid chemicals and liquefied gases - Foot valves

Citernes de transport de matières dangereuses - Équipements de la citerne pour le transport de produits chimiques liquides et de gaz liquéfiés - Clapets de fond

Tanks für die Beförderung gefährlicher Güter - Ausrüstung für Tanks für die Beförderung von flüssiger Chemieprodukte und Flüssiggase - Bodenventile

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 CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

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: Avenue Marnix 17, B-1000 Brussels

Ref. No. prEN 14433:2013: E

Contents

Page

Foreword

This document (prEN 14433:2013) has been prepared by Technical Committee CEN/TC 296 “Tanks for transport of dangerous goods”, the secretariat of which is held by AFNOR.

This document is currently submitted to the CEN Enquiry.

This document will supersede EN 14433:2006.

According to edition EN 14433:2006 the following fundamental changes are given:

1 Scope

This European Standard specifies the requirements for footvalves for use on transportable tanks with a minimum working pressure greater than 50 kPa for the transport of dangerous goods by road and rail.

It is applicable to equipment for use on tanks with gravity and/or pressure bottom loading and discharge for liquid chemicals and liquefied gases. It includes carbon dioxide while excluding cryogenic gases.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 12266-1:2003, *Industrial valves - Testing of valves - Part 1: Pressure tests, test procedures and acceptance criteria - Mandatory requirements*

EN 12266-2:2008, *Industrial valves - Testing of valves - Part 2: Tests, test procedures and acceptance criteria - Supplementary requirements*

EN 12516-1, *Industrial valves - Shell design strength - Part 1: Tabulation method for steel valve shells*

EN 12516-2, *Industrial valves - Shell design strength - Part 2: Calculation method for steel valve shells*

EN 12516-3, *Valves - Shell design strength - Part 3: Experimental method*EN 13445, *Unfired pressure vessels*

EN ISO 6708, *Pipework components - Definition and selection of DN (nominal size) (ISO 6708)*

3 Terms and definitions

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

3.1
maximum working pressure (ADR/RID chapter 6.8)
MWP
maximum pressure up to which the valve can be operated, at least the test pressure divided by 1,3

3.2
maximum allowable working pressure (ADR/RID chapter 6.7)
MAWP
maximum pressure up to which the valve can be operated, at least the test pressure divided by 1,3 (liquified gases) respectively 1,5 (liquids)

3.3
test pressure
the pressure used for the pressure tests

3.4
nominal size
designated size of valve as defined in EN ISO 6708

4 Function

The footvalve is a primary valve located in the lower part of the tank to ensure that escape of product from the tank is prevented.

5 Design and materials

5.1 General

The footvalve shall be designed for a working pressure of at least 300 kPa. The footvalve shall normally be a non-pressure balanced design. If the valve is a pressure balanced design, a surge pressure of 5 times the MWP shall not jeopardize the tightness of the housing or the function of the valve. The manufacturer shall specify in drawings and other papers, the design and the materials of the footvalve. The valve specification shall include information regarding mating tank flange details.

5.2 Design

5.2.1 The valve shall provide a closure located within the envelope of the tank.

5.2.2 The valve closure shall be positioned so that the pressure in the tank acts to increase the force on the valve seat, and shall be so designed as to prevent self-opening of the valve.

5.2.3 The opening of the valve shall be such as to give a minimum flow path through the valve of a diameter equal to the DN designation of the valve.

5.2.4 The operating mechanism shall be protected from inadvertent operation in transit either by a latching device or by locating within an enclosure.

5.2.5 The internal stop-valve of all filling and all discharge openings of tanks (for tank containers with a capacity greater than 1 m^3) intended for the carriage of liquefied flammable or toxic gases shall be instant-closing and shall close automatically in the event of an unintended movement of the tank or in the event of fire. It shall also be possible to operate the internal stop-valve by remote control.

5.2.6 As a minimum, each valve shall be marked with the direction of opening of the operating mechanism.

5.2.7 The external valve casing shall have a weakened section (e.g. a shear groove in the external casing or other appropriate means) so positioned that should the valve casing be removed by a severe impact, the sealing capability of the valve shall not be affected. This requires that, in the case of a bottom-operated valve, the operating mechanism of the valve be not directly connected to the valve closure.

5.2.8 Regarding the calculation of flanges and body wall thickness the requirements given in EN 12516-1 to EN 12516-3 or EN 13445 apply.

5.3 Materials

5.3.1 The manufacturer shall provide, with the equipment, the material specification for those parts that may come into contact with the product.

5.3.2 The material elongation at fracture of the pressure-loaded components of the valve shall be a minimum of 12 %.

5.3.3 The relevant EN reference, where possible, for the valve casing material shall be permanently marked on the valve casing. Should no EN exist then the appropriate national standard designation may be used.

EXAMPLE:

1.4404: indicates ASTM 316L type stainless steel in accordance with EN 10216-5 for unwelded pipes..

6 Test media

6.1 Hydraulic tests

Hydraulic tests shall be carried out using a fluid in accordance with EN 12266-2:2002, A.1.5.

6.2 Pneumatic tests

Pneumatic tests shall be carried out using a gas in accordance with EN 12266-2:2002, A.1.5.

7 Type tests

7.1 General

Each valve used for testing shall conform to the drawings and dimensions specified and specification provided by the manufacturer. Each design of valve, as verified in Annex A, shall be subjected to a type test. Type testing according to 7.2 to 7.6 shall be carried out under ambient conditions. If the valve is required to operate outside the temperature range –40 °C to +50 °C, the design shall be taken into account either in the type testing or by a validated calculation method. For the calculation of the test pressure clauses 6.3 and 6.4 of EN 12516-3 apply.

The tests shall be carried out with the casing/valve attached to a flange equivalent to that for which its use is intended.

7.2 Valve casing hydraulic pressure test

The valve casing shall be hydraulically tested, using a test medium conforming to 6.1 at a pressure equal to a minimum of 2,25 times the MWP or 400 kPa whichever is the greater. The test pressure shall be maintained for a minimum of 5 min on the valve casing without permanent deformation occurring.

7.3 Valve assembly pressure test

The valve assembly shall be hydraulically or pneumatically tested, using a test medium conforming to 6.1 or 6.2 at a pressure equal to 1,5 times the MWP (MAWP), or 400 kPa, whichever is the greater. The test pressure shall be maintained for a minimum of 10 min on the valve assembly. The leakage shall not exceed Rate A as defined in EN 12266-1:2003, Table A.5. Each assembly pressure test shall be carried out:

a) with the valve in the closed position and the outlet open to test for leakage from the seats;

b) with the valve in the open position and the outlet closed off to test for leakage from gland seals and body joints.

7.4 Closure, casing and valve assembly pneumatic tightness tests

For each design of the valve, as defined in Annex B, the closure, the casing and the valve assembly shall be pneumatically tested, using a test medium conforming to 6.2, at pressures equal to 20 kPa and 1,0 times the MWP (MAWP).

The valve closure, casing and valve assembly shall be totally immersed in a water bath, or, where total immersion of the valve closure, casing and valve assembly is not possible, a suitable leak detection fluid shall be applied. The test pressure shall be maintained for a minimum of 10 min on the valve closure, casing and

valve assembly. The leakage shall not exceed Rate A as specified in EN 12266-1. Each pneumatic tightness test shall be carried out:

a) with the valve in the closed position and the outlet open to test for leakage from the valve seats;

b) with the valve in the open position and the outlet closed off to test for leakage from gland seals or body joints.

If the tests defined above do not cover all seals to the environment, these seals of the valve assembly shall also be tested.

7.5 Cyclic test

The valve assembly shall be subjected to a mechanical cycle test to a minimum of 1 000 full cycles (“open” to “closed”) without pressure and 10 full cycles (“open” to “closed”) at MWP (MAWP) or maximum rating coupling pressure at ambient temperature being applied. After completion of the cyclic test, the valve shall be tested in accordance with 7.4 and the leakage shall not exceed Rate A as defined in EN 12266-1:2003, Table A.5.

7.6 Breakaway test

7.6.1 General

The footvalve shall be attached with a suitable gasket to a flange of minimum dimensions as defined in 5.1. The flange shall be attached to a test vessel which simulates the tank connection. All bolts intended for tank attaching of the valve shall be tightened. Vertical drop valves that are intended to be mounted to the tank and followed immediately by a tee pipe to the side of the tank should have a tee/elbow fitted to the outlet flange prior to the rigid beam. Following the breakaway of the valve body, the valve shall be hydraulically tested at pressures equal to 20 kPa and 1,0 times the MWP (MAWP). The test pressure shall be maintained for a minimum of 10 min and the leakage shall not exceed Rate B as defined in EN 12266-1:2003, Table A.5.

7.6.2 Test apparatus

Rigid beam: beam which is capable of transmitting the impact load to the valve without permanent deformation, 1 000 mm long, rigidly attached to the foot valve outlet flange.

Test vessel; pressurizable test chamber which simulates the tank and has a MWP (MAWP) at least equal to the valve to be tested.

Suitable gasket material: either the specific gasket material to be specified with the valve or for a range of gasket material with the lowest required seating stresses with compression recovery rate.

Tee/elbow; to change the direction of the outlet pipe simulating the piping connection to the tank.

7.6.3 Test procedure for valves conforming to ADR 6.8

Apply, to the beam 1 000 mm from the centre line of the inlet flange, a sufficient force, perpendicular to the valve outlet pipe and in the same plane as the foot valve tank flange, until the valve body breaks away at the shear device, or the outlet deforms more than 30°.

7.6.4 Test procedure for valves conforming to ADR 6.7

Apply, load slowly and directly on to the outlet flange or as close as is practicable. The load shall be applied in a vector perpendicular to the ground relative to the perceived fitting of the valve consistent and with the valve being struck from mis-stacking. The load shall be applied until the valve body breaks away at the shear groove, or the outlet takes permanent set and deforms more than 30°.

7.6.5 Test procedure for top operated valves

The top operated valve shall be connected to the test vessel in such a manner that the valve poppet is located in the closed position by the connecting rod/tube/wire. The outlet tee/elbow containing the shear device shall be attached to the suitable flange of the test vessel with the extension beam and the test procedure shall follow 7.6.3.

7.6.6 Post impact adjustments

a) Manual reseating of the valves poppet is not permitted.

b) Retightened fasteners to stop any leakage from the valve gasket is not permitted

c) Non breakage of shear device is permitted provided that the outlet deflection is greater than 30° and that leakage rate of less than rate B into the valve body after the initial impact and all operating mechanism are attached to the valve.

7.6.7 Test report requirements

The gasket material and contact sealing dimensions along with bolting material and size shall be reported in the shear test report.

8 Production tests

8.1 General

Each footvalve produced shall conform to the drawings and other papers in which the design and the materials were specified by the manufacturer. The production testing according to 8.2 to 8.4 shall be carried out under ambient conditions.

8.2 Function test

Each valve shall be opened and closed once.

8.3 Valve casing pressure test

Each valve casing shall be hydraulically or pneumatically tested, using a test medium conforming to 6.1 or 6.2, at a pressure equal to 1,5 times the MWP (MAWP). The casing shall be held in a position in which the valve will be used. The test pressure shall be maintained as given in EN 12266-1:2003, Table A.1 on the valve casing and the leakage shall not exceed Rate A as defined in EN 12266-1:2003, Table A.5.

8.4 Closure, casing and valve assembly pneumatic tests

Each closure, valve casing and valve assembly shall be pneumatically tested using a test medium conforming to 6.2, at pressures equal to 20 kPa and at least 25 % of the test pressure. The closure, casing and valve assembly shall be totally immersed in a water bath, or where total immersion of the valve closure, casing and valve assembly is not possible, a suitable leak detection fluid shall be applied. The test pressure shall be maintained as given in EN 12266-1:2003, Table A.1 on the valve closure, casing and valve assembly and the leakage shall not exceed Rate A as defined in EN 12266-1:2003, Table A.5. Each pneumatic tightness test shall be carried out:

a) with the valve in the closed position and the outlet open to test for leakage from the valve seats;