BS EN 16257:2012

BSI Standards Publication

Tanks for the transport of dangerous goods — Service equipment — Footvalve sizes other than 100 mm dia (nom)

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National foreword

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The UK participation in its preparation was entrusted to Technical Committee AUE/18, Tanks for the transport of dangerous goods.

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 69999 3

ICS 23.020.20

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This British Standard was published under the authority of the Standards Policy and Strategy Committee on 31 October 2012.

Amendments issued since publication

Date	Text affected

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 16257

October 2012

ICS 23.020.20

English Version

Tanks for the transport of dangerous goods - Service equipment - Footvalve sizes other than 100 mm dia (nom)

Citernes destinées au transport de matières dangereuses - Equipement de service - Clapets de fond avec diamètre nominal différent de 100 mm

Tanks für die Beförderung gefährlicher Güter - Bedienungsausrüstung - Bodenventile mit einem Nenndurchmesser von mehr oder weniger als 100 mm

This European Standard was approved by CEN on 25 August 2012.

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EUROPÄISCHES KOMITEE FÜR NORMUNG

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Ref. No. EN 16257:2012: E

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Foreword

This document (EN 16257:2012) has been prepared by Technical Committee CEN/TC 296 “Tanks for the transport of dangerous goods”, the secretariat of which is held by AFNOR.

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of an identical text or by endorsement, at the latest by April 2013, and conflicting national standards shall be withdrawn at the latest by April 2013.

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This European Standard forms part of a coherent standards programme comprising the following standards under the general title.

"Tanks for transport of liquid dangerous goods with vapour pressure not exceeding 110 kPa (absolute pressure) at 50 °C and petrol - Service equipment" :

EN 13081, *Tanks for transport of dangerous goods — Service equipment for tanks — Vapour collection adaptor and coupler;*

EN 13082, *Tanks for transport of dangerous goods — Service equipment for tanks — Vapour transfer valve;*

EN 13083, *Tanks for transport of dangerous goods — Service equipment for tanks — Adaptor for bottom loading and unloading;*

EN 13308, *Tanks for transport of dangerous goods — Service equipment for tanks — Non-pressure balanced footvalve;*

EN 13314, *Tanks for transport of dangerous goods — Service equipment for tanks — Fill hole cover;*

EN 13315, *Tanks for transport of dangerous goods — Service equipment for tanks — Gravity discharge coupler;*

EN 13316, *Tanks for transport of dangerous goods — Service equipment for tanks — Pressure balanced footvalve;*

EN 13317, *Tanks for transport of dangerous goods — Service equipment for tanks — Manhole cover assembly;*

EN 14595, *Tanks for transport of dangerous goods — Service equipment for tanks — Pressure and vacuum breather vent;*

EN 14596, *Tanks for transport of dangerous goods — Service equipment for tanks — Emergency pressure relief valve.*

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Introduction

The footvalve, also called emergency valve or internal security valve, the subject of this standard, is an internal self closing stop valve ensuring the primary containment to confine the dangerous substances within the tank when closed.

It allows the flow of dangerous substances in the unloading direction, that is, from the tank compartment into the run-off pipe only when externally actuated.

The non-pressure balanced footvalve shall be capable of allowing transfer of dangerous substances in the bottom loading direction through self-actuation by the hydraulic force of the loaded dangerous substances.

The pressure balanced footvalve does not allow flow of dangerous substances in either the loading or unloading direction when not externally actuated, and stops the flow if the external actuation is interrupted or disengaged.

1 Scope

This European Standard is applicable to non-pressure balanced and pressure balanced footvalves intended for loading and unloading and specifies the performance requirements, critical dimensions and tests necessary to verify the compliance of the equipment with this standard.

Footvalves covered by this European standard are unsuitable for use in applications where the product velocity exceeds 5 m/sec

The equipment specified by this standard is suitable for use with liquid petroleum products and other dangerous substances of Class 3 of ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road – (flammable liquids) which have a vapour pressure not exceeding 110 kPa at 50 °C and petrol, and which have no sub-classification as toxic or corrosive.

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 13308:2002, *Tanks for transport of dangerous goods — Service equipment for tanks — Non-pressure balanced footvalve*

EN 13316:2002, *Tanks for transport of dangerous goods — Service equipment for tanks — Pressure balanced footvalve*

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 13308:2002 and EN 13316:2002 apply.

4 Functions

The requirements for non-pressure balanced footvalves shall be in accordance with Clause 4 of EN 13308:2002 and for pressure balanced footvalves in accordance with Clause 4 of EN 13316:2002.

Smaller dimensions for other purposes than loading and unloading (e.g. emptying the water sump of aircraft refuellers) may be used provided that all the requirements given in the standard are fulfilled. If smaller sizes than those given in the annexes of this standard are chosen, the dimensions of the flanges for connecting the tank and the pipework shall be designed for those dimensions.

5 Design characteristics

The minimum requirements for each type of footvalve are as follows.

5.1 Pressure rating

The requirements for non-pressure balanced footvalves shall be in accordance with 5.1 of EN 13308:2002 and for pressure balanced footvalves in accordance with 5.1 of EN 13316:2002.

5.2 Mounting

The tank mounting flange dimensions shall be in accordance with Annex A.

The pipe connection flange dimensions shall be in accordance with Annex B or Annex C according to the specified type.

5.3 Actuation

The requirements for non-pressure balanced footvalves shall be in accordance with 5.5 of EN 13308:2002 and for pressure balanced footvalves in accordance with 5.5 of EN 13316:2002.

5.4 Break-away security

The footvalve seat shall be designed to be located within the envelope of the tanker compartment

The footvalve shall be designed with reference to Annexes D and E, such that in the event of accidental damage, the external housing shall break away, leaving the footvalve sealing mechanism within the tank compartment intact.

The impact energy required to break away the external housing of footvalves

— with a nominal diameter of less than 100 mm shall not exceed 1 kJ

— with a nominal diameter greater than 100 mm shall not exceed the value given by:

$(dt /100)^2$ in kJ

where

d_t is the nominal diameter in mm.

5.5 Temperature range

The requirements for non-pressure balanced footvalves shall be in accordance with 5.7 of EN 13308:2002 and for pressure balanced footvalves in accordance with 5.7 of EN 13316:2002.

5.6 Materials of construction

The requirements for non-pressure balanced footvalves shall be in accordance with 5.8 of EN 13308:2002 and for pressure balanced footvalves in accordance with 5.8 of EN 13316:2002.

Whenever possible, selected materials shall be recyclable and sustainable.

5.7 Electrical resistance

The requirements for non-pressure balanced footvalves shall be in accordance with 5.9 of EN 13308:2002 and for pressure balanced footvalves in accordance with 5.9 of EN 13316:2002.

5.8 Strainer

The requirements for non-pressure balanced footvalves shall be in accordance with 5.10 of EN 13308:2002 and for pressure balanced footvalves in accordance with 5.10 of EN 13316:2002.

6 Tests

The test requirements for non-pressure balanced footvalves shall be in accordance with Clause 6 of EN 13308:2002 and for pressure balanced footvalves in accordance with Clause 6 of EN 13316:2002.

7 Marking

The marking requirements for non-pressure balanced footvalves shall be in accordance with Clause 7 of EN 13308:2002 and for pressure balanced footvalves in accordance with Clause 7 of EN 13316:2002

8 Installation, operating and maintenance recommendations

Installation, operation and maintenance instructions shall be provided for the equipment.

Annex A
(normative)

Footvalve to tank mounting flange dimensions

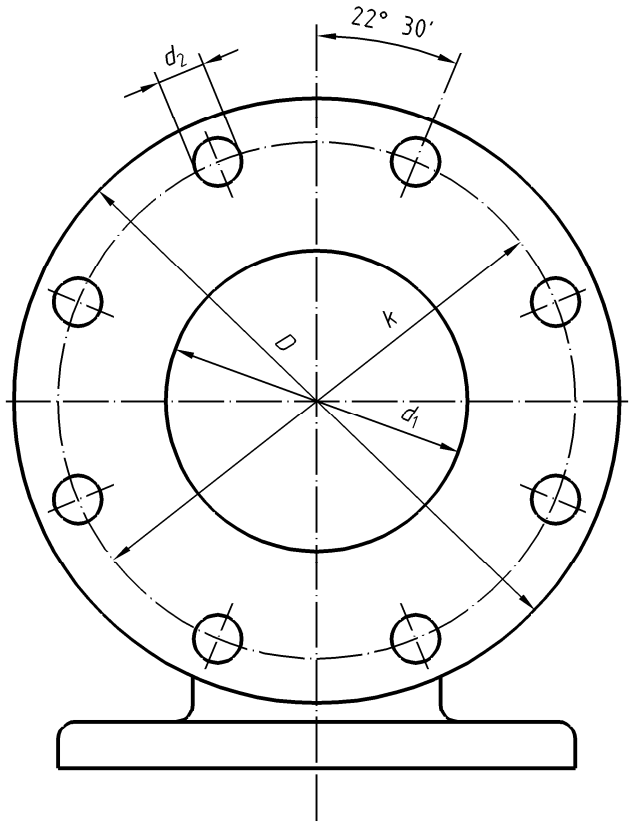


Figure A.1 — Footvalve to tank mounting flange dimensions [8 bolt hole spacing illustrated]

Table A.1 —Footvalve to tank mounting flange dimensions (Elbow type illustrated)

Dimensions in millimetres

Diameter		Drilling		
Outside diameter D_{max}	**Main spigot diameter** $d_{1\ max}$	**Pitch circle diameter** $k \pm 0,5$	**No. holes (equispaced)**	**Hole diameter** $^{+0,5}_{-0,3}$ d_2
270/268	188/200	240	12	14
230	163	190	8	14
215	118	180	6	13
154	88	130	8	11,6

Annex B
(normative)
Footvalve run-off flange dimensions

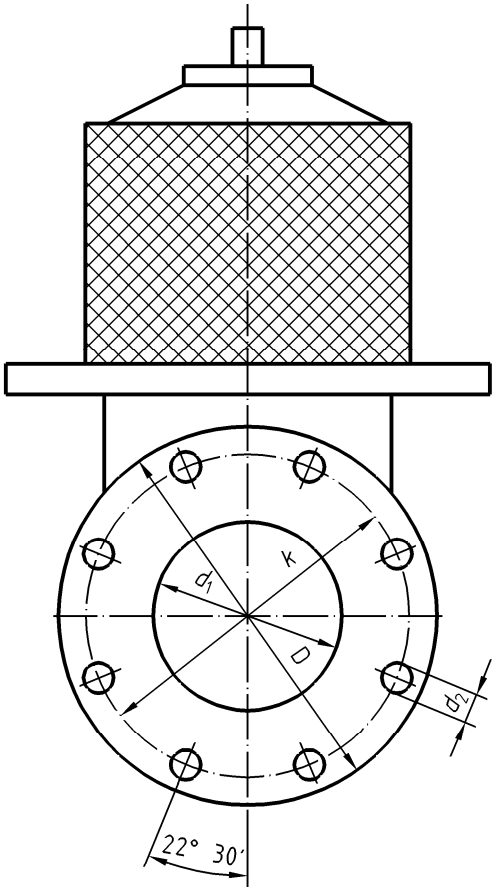


Figure B.1 — Footvalve run-off flange dimensions [8 bolt hole spacing illustrated]

Table B.1 —Footvalve run-off flange dimensions [Elbow type illustrated]

Dimensions in millimetres

Diameter		Drilling		
Outside diameter D_{max}	**Inside diameter** $d_1 \pm 1,0$	**Pitch circle diameter** $k \pm 0,5$	**No. holes (equispaced)**	**Hole diameter** d_2 $^{+0,5}_{-0,3}$
175	100	150	8	14
240/242	150	210	12	14
154	80	130	8	11,6
154	65	130	8	11,6

Annex C
(normative)

Footvalve run-off flange dimensions (square)

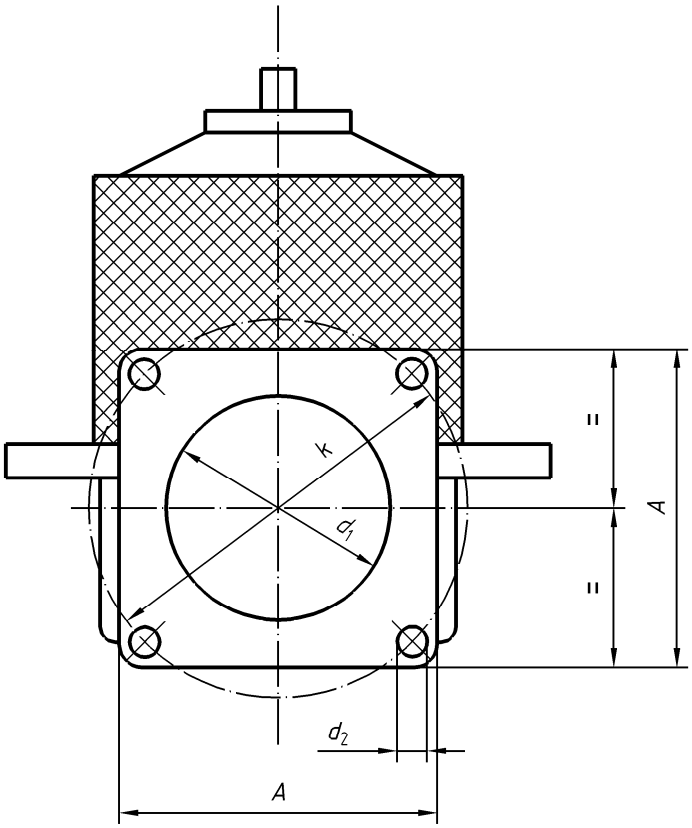


Figure C.1 — Footvalve run-off flange dimensions (square)

Table C.1 — Footvalve run-off flange dimensions (square)

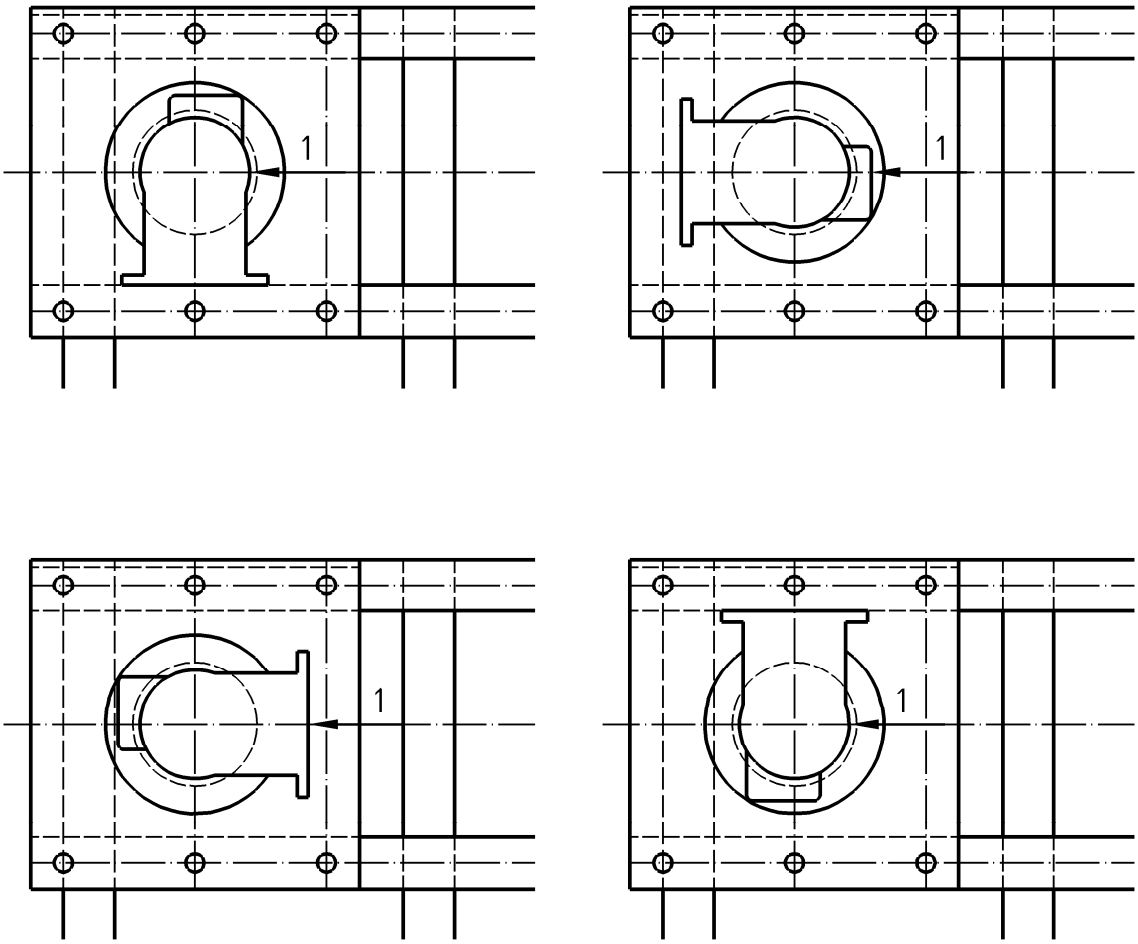
Dimensions in millimetres

Flange		Drilling		
A_{max}	Inside diameter $d_1 \pm 1,0$	Pitch circle diameter $k \pm 0,5$	No. holes (equispaced)	Hole diameter $^{+ 0,5}_{- 0,3}$ d_2
140	100	150	4	14
120	80	130	4	10,5
110	80	120	4	11

Annex D
(normative)

Break-away test positions

Dimensions in millimetres



Key

1 Point of impact

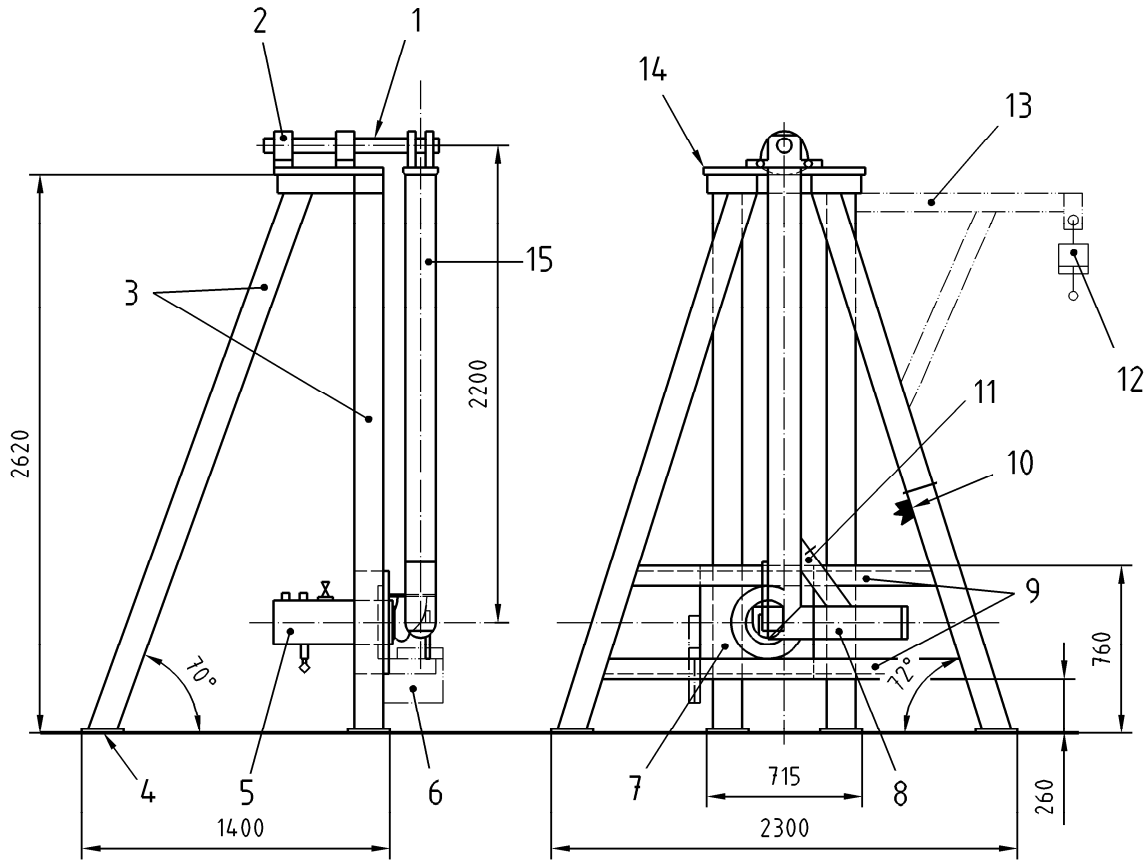
NOTE Impact point to be on centre line of valve.

Figure D.1 — Break-away test positions

Annex E
(informative)

Break-away test apparatus

The test rig is generally of steel construction and welded assy. Pendulum assembly to weigh (145 ± 7,25) kg.



Key

1	Shaft with a diameter of 63,5 mm	8	Solid bar with a diameter of 127 mm.
2	2off Bearing block	9	2 off Channel 150 mm x 76 mm x 5,5 mm
3	4off 152 mm x 76 mm RST	10	Optional extra restraining peg
4	Floor mounting plates secured by holding down bolts (4 – each)	11	150 mm x 12,5 mm thick bar (length to suit)
5	Small vessel	12	Optional extra hoist and quick release latch
6	Optional extra stop latch	13	Optional extra lifting bracket
7	Emergency valve mounting plate 25 mm thick	14	Bearing mtg plate 25 mm thick
		15	Pendulum assembly (127 mm N/B tube)

Figure E.1 — Break-away test apparatus

Annex F
(informative)

Preferred sizes

Dimensions in millimetres

The naming convention of the valves is d_t : d_p.

Table F.1 — Preferred combination of sizes

Tank shell mounting diameter d_t	Pipe mounting diameter d_p	65	80	100	125	150	200
200						x	x
150				x		x	
125				x	x		
100			x	Refer to EN 13308/ EN 13316			
80			x				
65		x					

NOTE For bottom loading CEN/TR 15120:2005, Table 1 provides recommendations on maximum flow rates for different pipe diameters.

NOTE Black fields signify that this combination is not recommended.

Bibliography

[1] *ADR European Agreement concerning the International Carriage of Dangerous Goods by Road*

[2] CEN/TR 15120:2005 *Guidelines for loading, transporting and unloading of dangerous liquid goods*

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

[4] EN 12266-2:2002, *Industrial valves — Testing of valves — Part 2: Tests, test procedures and acceptance criteria*

[5] ISO 2859-1, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*

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