BRITISH STANDARD

BS EN 13081:2008
+A1:2012

Tanks for transport of dangerous goods — Service equipment for tanks — Vapour collection adaptor and coupler

ICS 13.300; 23.020.20; 23.040.60

BSI
British Standards

National foreword

This British Standard is the UK implementation of EN 13081:2008+A1:2012. It supersedes BS EN 13081:2008 which is withdrawn.

The start and finish of text introduced or altered by amendment is indicated in the text by tags. Tags indicating changes to CEN text carry the number of the CEN amendment. For example, text altered by CEN amendment A1 is indicated by [A1] 〈A1〉.

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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EN 13081:2008+A1

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English Version

Tanks for transport of dangerous goods - Service equipment for tanks - Vapour collection adaptor and coupler

Citernes de transport de matières dangereuses - Equipement de service pour citernes - Adaptateur et coupleur pour la récupération des vapeurs

Tanks für die Beförderung gefährlicher Güter - Bedienungsausrüstung von Tanks - VKG- und MKG-Kupplungen für die Gassammelleitung

This European Standard was approved by CEN on 13 September 2008 and includes Amendment 1 approved by CEN on 24 December 2011.

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

This document (EN 13081:2008+A1:2012) has been prepared by Technical Committee CEN/TC 296 “Tanks for 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of an identical text or by endorsement, at the latest by August 2012, and conflicting national standards shall be withdrawn at the latest by August 2012.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes ⟦A1⟩ EN 13081:2008 ⟨A1⟧.

This document includes Amendment 1 approved by CEN on 2011-12-24.

The start and finish of text introduced or altered by amendment is indicated in the text by tags ⟦A1⟩ ⟨A1⟧.

⟦A1⟩ Compared to EN 13081:2008 the following changes have been made:

a) in 3.2 a definition for "probe" has been added;

b) in Annex A (normative) specifications for the opening of the adaptor have been added;

c) in Annex B (normative) specifications for the opening of the coupler have been added;

d) in Annex C (normative) specifications for the interlock have been added. ⟨A1⟧

This European standard forms part of a coherent standards programme comprising the following standards, under the general title "Tanks for transport of dangerous goods - Service equipment for tanks"

EN 13081, *Vapour collection adaptor and coupler*

EN 13082, *Vapour transfer valve*

EN 13083, *Adaptor for bottom loading and unloading*

EN 13308, *Non pressure balanced footvalve*

EN 13314*, Fill hole cover*

EN 13315, *Gravity discharge coupler*

EN 13316, *Pressure balanced footvalve*

EN 13317, *Manhole cover assembly*

EN 13922, *Overfill prevention systems for liquid fuels*

EN 14595, *Pressure and Vacuum Breather Vent*

EN 14596, *Emergency pressure relief valve*

EN 15208, *Sealed parcel delivery systems – Working principles and interface specifications*

The standards programme also includes the following Technical Report:

CEN/TR 15120, *Tanks for transport of dangerous goods - Guidance and recommendations for loading, transport and unloading*.

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

Introduction

The vapour collection adaptor and coupler are part of the vapour collection system that is required to comply with the European Directive 94/63/EC on Volatile Organic Compounds (VOC) [1].

The vapour collection adaptor and coupler establish a vapour tight path between the transport tank and the stationary loading and unloading facilities.

1 Scope

This European Standard covers the vapour collection adaptor and coupler used to achieve a vapour tight path between the transport tank and the stationary loading and unloading facilities.

This European Standard specifies the performance requirements and the critical dimensions of the vapour recovery adaptor fitted to the tank and the mating coupler fitted to a hose or to pipework connected to the stationary loading and unloading facilities. It also specifies the tests necessary to verify the compliance of the equipment with this standard. The equipment specified by this European Standard is suitable for use with liquid petroleum products and other dangerous substances of Class 3 of ADR [2] 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 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 amendments) applies.

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

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

EN 15208:2007, *Tanks for transport of dangerous goods - Sealed parcel delivery systems – Working principles and interface specifications*

EN ISO 1302, *Geometrical Product Specifications (GPS) – Indication of surface texture in technical product documentation (ISO 1302:2002)*

EN ISO 4287, *Geometrical Product Specifications (GPS) — Surface texture: Profile method — Terms, definitions and surface texture parameters (ISO 4287:1997)*

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

3 Terms and definitions

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

3.1
Maximum Working Pressure (MWP) gauge pressure
maximum pressure to which the equipment is designed to operate, being the highest of the following three pressures:

a) highest effective pressure allowed in the tank during filling (maximum filling pressure allowed)

b) highest effective pressure allowed in the tank during discharge (maximum discharge pressure allowed)

c) effective gauge pressure to which the tank is subjected by its contents (including such extraneous gases as it may contain) at the maximum working temperature

〈A1〉 3.2
probe
device used to displace the obturator (poppet) of the adaptor 〈A1〉

4 Function

The vapour collection adaptor and coupler shall provide the following:

— a quick action vapour tight mechanical connection between the transport tank and the stationary loading and unloading facilities for the transfer of vapour;

— vapour tightness when not connected.

The vapour collection adaptor may be capable of accepting interlock actuators and similar devices, see Annex C.

The vapour collection adaptor may have provision for a sight glass to check for the presence of liquid.

The vapour collection adaptor may have provision for the drainage of liquid.

5 Design characteristics

5.1 General

The vapour collection adaptor and coupler shall permit the transfer of vapour only after initiation of the mating action.

5.2 Performance characteristics

The manufacturer shall provide the pressure drop curves for both the vapour collection adaptor and coupler at the following conditions:

— flow rate up to 1 500 standard m^3/h of air at 20 °C (1 500 standard m^3/h of air corresponds to the bottom loading of 5 compartments simultaneously each at 150 m^3/h flow of substances).

5.3 Pressure ratings

The vapour collection adaptor shall be capable of operating at the MWP of the transport tank to which it is attached.

The vapour collection coupler shall be capable of operating at the MWP of the stationary loading and unloading facility to which it is attached.

5.4 Temperature range

Unless otherwise specified, the design temperature range shall be – 20 °C to + 50 °C.

Where the vapour collection adaptor and coupler are subjected to more severe conditions, the design temperature range shall be extended to – 40 °C or + 70 °C as applicable.

5.5 Materials of construction

The manufacturer shall provide with the equipment a full material specification for those parts that may come into contact with the substances described by Clause 1.

5.6 Dimensional characteristics

The dimensions, tolerances and surface machined finish of the vapour collection adaptor and coupler shall be as given in Annexes A and B (see Figures A.1 and B.1).

The mounting dimensions of the flange connecting the vapour collection adaptor to the pipework of the tank shall be as follows:

— outside diameter (maximum) : 174 mm;

— inside diameter (minimum) : 100 mm;

— pitch circle diameter : 150 mm;

— number of holes : 8 equispaced;

— hole diameter : 14 mm.

NOTE 1 Tolerances ± 1 mm.

NOTE 2 Holes should straddle adaptor centre line.

NOTE 3 A 4 hole mounting, which can accommodate the specified 8 hole flange without loss of performance may be used as an option, see Annex D.

6 Tests

6.1 General

Two classes of tests are required: production tests and type tests.

Testing methods and procedures shall conform to EN 12266-1 and EN 12266-2 except as specified within this European Standard.

Unless otherwise specified, test fluids shall be air or other suitable gas. The choice of the fluid is the responsibility of the manufacturer.

NOTE Where the obturator forms part of the pressure containing shell, it may be closed during strength and tightness tests.

6.2 Production tests

6.2.1 General

The number, frequency and sampling methods of production test samples shall not be less than those specified within ISO 2859-1 (AQL of 2,5).

Production tests shall comprise the following:

— shell tightness test;

— internal seat tightness test; and

— operability test.

6.2.2 Shell tightness test

6.2.2.1 Test pressure

The test pressure shall conform to A.3.2.2 of EN 12266-1:2003.

6.2.2.2 Test duration

The test duration shall conform to A.3.2.3 of EN 12266-1:2003.

6.2.2.3 Acceptance criteria

The acceptance criteria shall conform to A.3.3 of EN 12266-1:2003.

6.2.3 Internal seat tightness test

6.2.3.1 Valve classification type (for test method selection only)

The valve classification type shall be a check valve as in EN 12266-1:2003, Table A.3.

6.2.3.2 Test pressure

The test pressure shall be 5,5 kPa.

6.2.3.3 Test duration

The test duration shall conform to Table A.4 of EN 12266-1:2003.

6.2.3.4 Acceptance criteria

The acceptance criteria shall conform to rate A of EN 12266-1:2003, Table A.5.

6.2.4 Operability test

The operability test shall conform to B.1 of EN 12266-2:2002.

6.2.5 Test results

Test results shall be recorded and maintained in accordance with the manufacturer's procedures.

6.3 Type tests

6.3.1 General

A minimum of 2 production samples of each model type shall be type tested to demonstrate the performance and mechanical strength of the design.

NOTE Devices having one design, size and set pressure are considered to be of one model type.

Unless otherwise noted, all type tests shall be performed at maximum and minimum design temperatures.

Type tests shall comprise the following:

— shell strength test;

— shell tightness test;

— internal seat tightness test;

— mechanical endurance test; and

— mechanical strength test.

6.3.2 Shell strength test

6.3.2.1 Test pressure

The test pressure shall be 1 000 kPa or 1,5 times the maximum working pressure (MWP) of the equipment, whichever is the higher.

6.3.2.2 Test duration

The test duration shall conform to Table A.2 of EN 12266-1:2003.

6.3.2.3 Acceptance criteria

The acceptance criteria shall conform to A.2.3 of EN 12266-1:2003.

The test shall be carried out only under ambient conditions.

6.3.3 Shell tightness test

The shell tightness test shall be performed in accordance with the requirements of the production test.

The test shall be carried out only under ambient conditions.

6.3.4 Internal seat tightness test

The internal seat tightness test shall be performed in accordance with the requirements of the production test at the following two test pressures:

— 5,5 kPa;

— 20 kPa.

6.3.5 Mechanical endurance test

The mechanical endurance test shall be performed in accordance with the requirements of the production operability test with the following additions:

— the endurance test shall be considered satisfactory if the vapour collection adaptor and coupler under test are operable and pass the internal seat tightness test (with an acceptance criteria of Rate B of EN 12266-1:2003, Table A.5) after 25 000 unlubricated opening and closing operations without any of their parts having been changed.

The test shall be carried out only at ambient conditions.

6.3.6 Mechanical strength test

Both the adaptor and the coupler shall, separately, be subjected to a side force of 250 N, the line of action of which passes along and parallel to the coupling faces.

The adaptor and coupler shall, separately, be secured to a suitable rigid support, with their longitudinal axes horizontal, for the test.

The side force shall be applied twice for a duration of 5 s in each case.

The test shall be carried out only under ambient conditions.

The test is considered satisfactory if no visual or functional damage is sustained.

6.3.7 Test results

The test results shall be recorded and maintained for a time period that shall not be less than the manufactured life of the product.

7 Marking

The vapour collection adaptor and coupler shall each have all the following permanent identification markings:

— reference to this standard;

— manufacturer's name and/or logo;

— manufacturer's type or assembly number;

— serial number and/or date of manufacture;

— MWP;

— any special operating conditions.

8 Installation, operation and maintenance instructions

The equipment shall be provided with installation, operation and maintenance instructions.

In order to facilitate the coupling operation, the vapour collection adaptor should be positioned to permit connection, see CEN/TR 15120 [3].

Annex A
(normative)

Vapour collection adaptor to be fitted on the transport tank

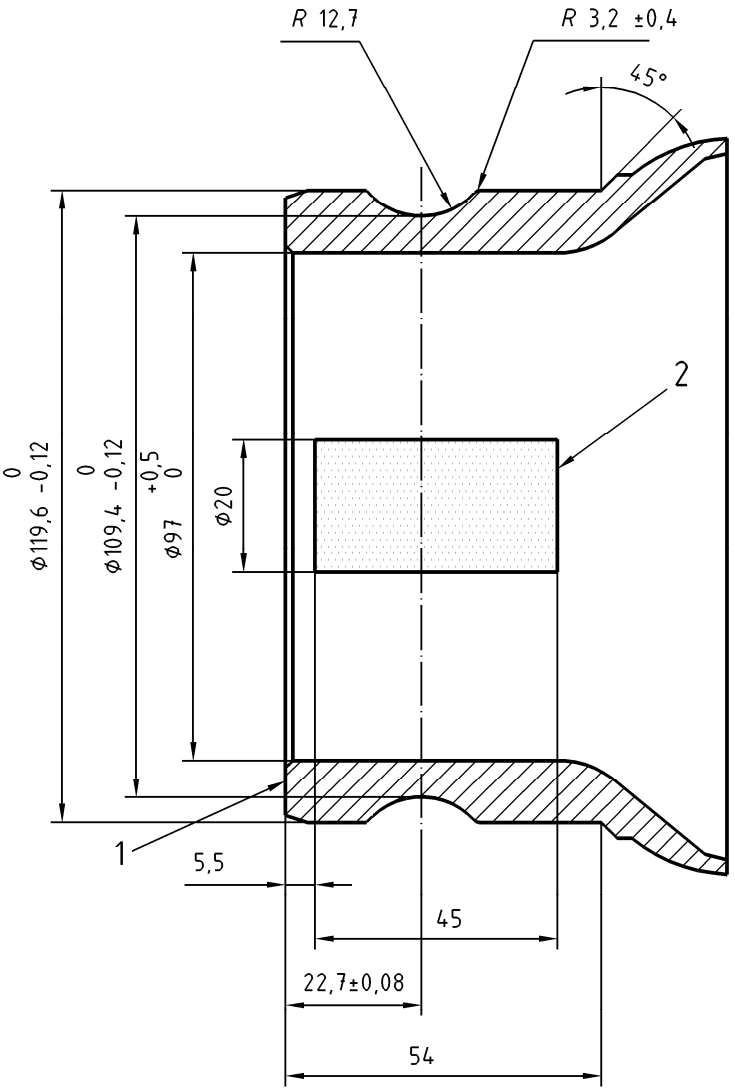
[A1] The adaptor shall be opened by the axial displacement of the coupler probe when mated. Sharp edges shall be removed. [A1] No corner shall have a radius of more than 3,2 mm.

The details of the adaptor body and internals, other than those shown in Figure A.1 specified as standard criteria, are to be determined by the manufacturer.

The sealing surface shall have a finished face with R_a = 1,6 μm according to EN ISO 1302 and EN ISO 4287.

Unless otherwise noted, general tolerances are $\pm$ 1 mm.

Dimensions in millimetres



Key

1 Sealing surface

2 [A1] volume occupied by the coupler probe when mated [A1]

Figure A.1 — Vapour collection adaptor to be fitted on the transport tank

Annex B
(normative)

Vapour collection coupler to be fitted to the stationary loading and unloading facility

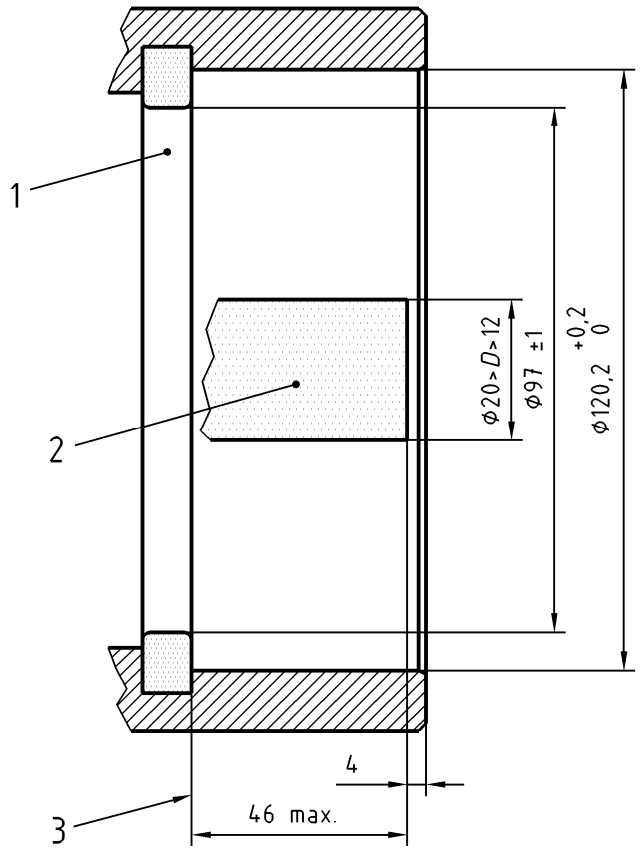
[A1] The coupler shall be opened by means other than the axial displacement of the coupler probe. Sharp edges shall be removed. [A1] No corner shall have a radius of more than 3,2 mm.

The details of the coupler body and internals, other than those shown in Figure B.1 specified as standard criteria, are to be determined by the manufacturer.

The sealing surface shall have a finished face with R_a = 1,6 µm according to EN ISO 1302 and EN ISO 4287.

Unless otherwise noted, general tolerances are ± 1 mm.

Dimensions in millimetres



Key

1 Replaceable valve seat gasket
2 [A1] volume occupied by the probe [A1]
3 Sealing surface

Figure B.1 — Vapour collection coupler to be fitted to the stationary loading and unloading facility

Annex C
(normative)

Interlock and other devices

C.1 Interlock

Interlock operating range.

The interlock is shown in Figure C.1.

[A1] Interlock switch-over point shall be mid-travel ± 3,5 mm.

The dimension of the radial gap between adaptor and actuator interlock vane shall be no more than 5 mm. [A1]

[A1] (Tolerance + 2,0/- 0 mm) [A1]

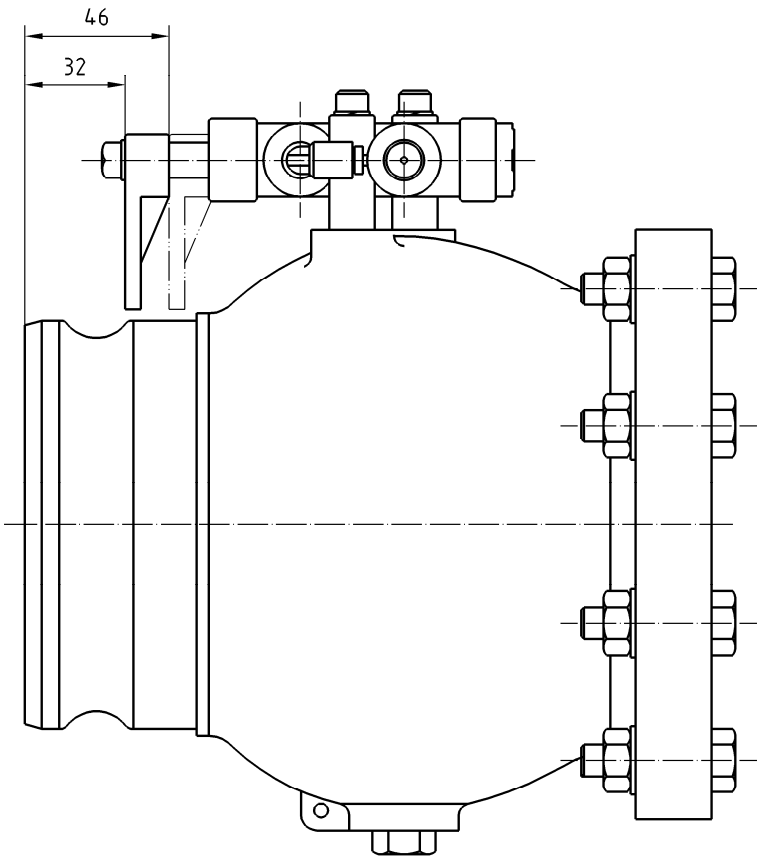


Figure C.1 — Interlock

C.2 DTQM tank identifier

In accordance with EN 15208:2007 Annex A, tanks may have an identifier vane fitted to the vapour adaptors.

Dimensions in millimetres

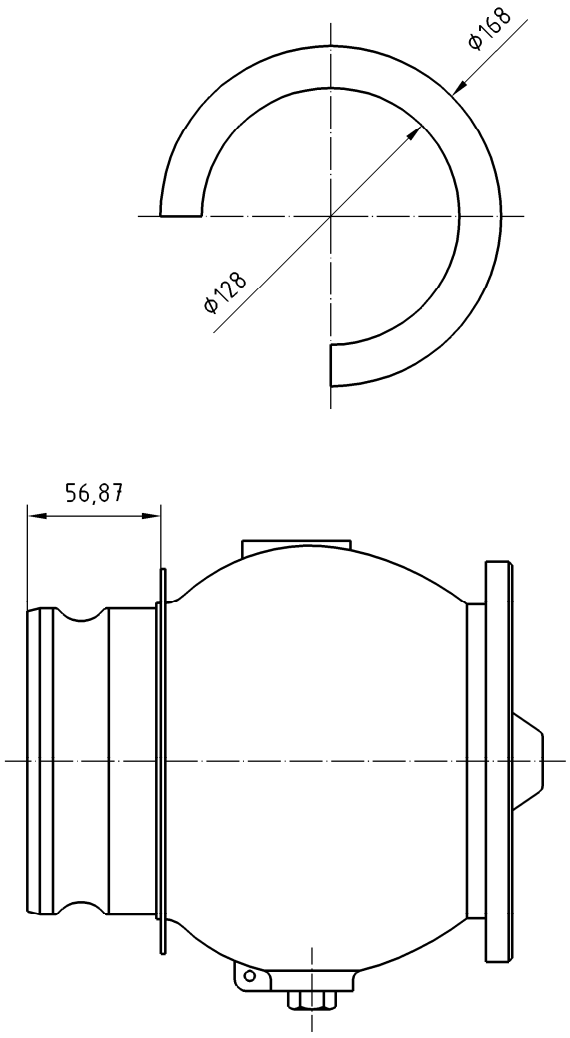
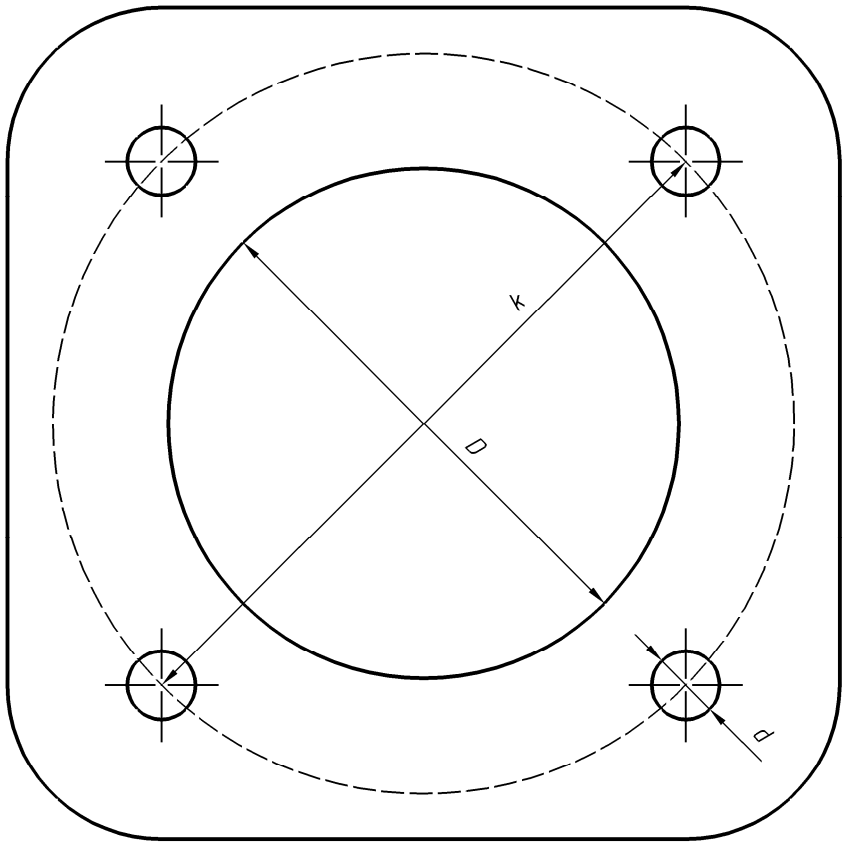


Figure C.2 — DTQM tank identifier (for mounting on the vapour adaptor)

Annex D
(informative)

4 hole fixing

The hole 4 hole fixing is shown in Figure D.1.



Key

hole size (d) = 14 mm

internal diameter (minimum) (D)= 100 mm

pitch circle diameter = 150 mm

Figure D.1 — 4 hole fixing

Bibliography

[1] VOC European Directive 94/63/EC on Volatile Organic Compounds

[2] ADR. European Agreement concerning the International Carriage of Dangerous Goods by Road — (flammable liquids)

[3] CEN/TR 15120, Tanks for transport of dangerous goods – Guidance and recommendations for loading, transport and unloading

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