

TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000KE
Revision No:
3

This is to certify:

That the Strainer

with type designation(s)
08416, 08417, 08432, 08716, 08717, 08732

Issued to
HEROSE G.M.B.H. ARMATUREN UND METALLE
Bad Oldesloe, Schleswig-Holstein, Germany

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV class programme DNV-CP-0186 – Type approval – Valves

Application :

Strainers approved by this certificate are accepted for installation on all vessels classed by DNV.

Type:	Temperature range:	Max. working press.:	Sizes:
08416	-196°C to +120°C	PN50	DN10 to DN50
08417	-196°C to +120°C	PN50	DN10 to DN200
08432	-196°C to +120°C	PN40	DN15 to DN150
08716	-255°C to +120°C	PN50	DN10 to DN50
08717	-255°C to +120°C	PN50	DN10 to DN150
08732	-196°C to +120°C	PN40	DN15 to DN150

Issued at **Hamburg** on **2022-11-28**

for **DNV**

This Certificate is valid until **2027-11-27**.

DNV local unit: **Hamburg**

Approval Engineer: **Ana Cristina Do Carmo Insfran**

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Sven Klinger
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Type: 08416

Stainless steel body and cap with strainer screen mesh size 0.25 mm or other mesh sizes.
 Female thread connection (G) acc. to ISO 228/1, (R) acc. to ISO 7-Rc, NPT acc. to ANSI B 1.20.1

Materials:

Body:	Mat.No. 1.4308,	ASTM A351 CF8
Strainer screen:	Mat.No. 1.4301	ASTM A240 Grade 304
Bonnet gasket:	PTFE	
Bolts:	Mat.No. 1.4301/A2	ASTM A194 B8
Cap:	Mat.No. 1.4301	ASTM A276 Grade 304

Nominal sizes: DN 10, 15, 20, 25, 40, 50

Type: 08417

Stainless steel body and cap with strainer screen mesh size 0.25 mm or other mesh sizes
 Butt weld or socket weld connection or stainless steel stubs according to DIN EN ISO 1127 or ASTM A312

Materials:

Body:	Mat.No. 1.4308	ASTM A351 CF8
Strainer screen:	Mat.No. 1.4301	ASTM A240 Grade 304
Bonnet gasket:	PTFE	
Bolts:	Mat.No. 1.4301/A2	ASTM A194 B8
Cap:	Mat.No. 1.4301	ASTM A276 Grade 304

Nominal sizes: DN 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 150, 200

Type: 08432

Stainless steel body and cap with strainer screen mesh size 0.25 mm or other mesh sizes.
 Flanged connection acc. to DIN EN 1092-1 PN40 or ANSI B16.5 Class 150 / 300

Materials:

Body:	Mat.No. 1.4308	ASTM A351 CF8
Strainer screen:	Mat.No. 1.4301	ASTM A240 Grade 304
Bonnet gasket:	PTFE	
Bolts:	Mat.No. 1.4301/A2	ASTM A194 B8
Cap:	Mat.No. 1.4301	ASTM A276 Grade 304

Nominal sizes: DN 15, 20, 25, 40, 50, 65, 80, 100, 150

Type: 08716

Stainless steel body and cap with strainer screen mesh size 0.25 mm or other mesh sizes
 Female thread connection (G) acc. to ISO 228/1, (R) acc. to ISO 7-Rc, NPT acc. to ANSI B 1.20.1

Materials:

Body:	Mat.No. 1.4409	ASTM A351 CF3M
Strainer screen:	Mat.No. 1.4404	ASTM A276 Grade 316L
Bonnet gasket:	Graphite	
Bolts:	Mat.No. 1.4571/A4	ASTM A194 B8T
Cap:	Mat.No. 1.4404	ASTM A276 Grade 316L

Nominal sizes: DN 10, 15, 20, 25, 40, 50

Product description - continuation

Type: 08717

Stainless steel body and cap with strainer screen mesh size 0.25 mm or other mesh sizes.
 Butt weld or socket weld connection or stainless steel stubs according to DIN EN ISO 1127 or ASTM A312

Materials:

Body:	Mat. No. 1.4409	ASTM A351 CF3M
Strainer screen:	Mat. No. 1.4404	ASTM A276 Grade 316L
Bonnet gasket:	Graphite	
Bolts:	Mat.No. 1.4571/A4	ASTM A194 B8T
Cap:	Mat.No. 1.4404	ASTM A276 Grade 316L

Nominal sizes: DN 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 150

Type: 08732

Stainless steel body and cap with strainer screen mesh size 0.25 mm or other mesh sizes.
 Flanged connection according to EN 1092-1 PN 40; ANSI B16.5 Class 150/300

Materials:

Body:	Mat. No. 1.4409	ASTM A351 CF3M
Strainer screen:	Mat. No. 1.4404	ASTM A276 Grade 316L
Bonnet gasket:	Graphite	
Bolts:	Mat.No. 1.4571/A4	ASTM A194 B8T
Cap:	Mat.No. 1.4404	ASTM A276 Grade 316L

Nominal sizes: DN 15, 20, 25, 40, 50, 65, 80, 100, 150

Application/Limitation

May be used for:
 Compressed air, gases, cryogenic liquified gases including LNG

Working temperature:

Type: 08416, 08417, 08432	=> -196°C to + 120°C
Type: 08716, 08717, 08732	=> -255°C to + 120°C

Working pressures:

Type: 08416, 08716	=> PN50
08417	=> PN50; DN100, DN150 =>PN40; DN200=>PN25
Type: 08432, 08732	=> PN 40
08717	=>PN50; DN150 =>PN40

Limitation

Strainers may not be used for sour gas and media specified as toxic and/or dangerous fluids

Valves with threaded connections are NOT permitted for installation in fuel pipes systems and cargo pipes systems on board of DNV classed liquefied gas tankers and in ship's LNG and gas fuel systems.

Valves with threaded connections shall only be used for accessory lines and instrumentation lines with external diameters of 25 mm or less.

For valves to be installed on board of ships other than liquefied gas tankers the following limitations apply:

Valves for installation in systems operating with flammable gases are to be classed within Pipe Class I, see DNV Rules Pt. 4 Ch. 6 - Piping systems.

Threaded joints may be used for outside diameters as stated below except for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.

- Threaded joints in CO₂ systems shall be allowed only inside protected spaces and in CO₂ cylinder rooms
- Threaded joints with tapered thread shall be allowed for pipe class I, outside diameter not more than 33,7 mm.
- Pipe Class II and Class III outside diameter not more than 60,3 mm.
- Threaded joints with parallel thread shall be allowed for Pipe class III, outside diameter not more than 60.3 mm.

Installation

The following valve connections are permitted for installation in liquefied gas applications (including LNG):

- But welded joints with full penetration welding
- Flange connections in accordance with recognized standards

For all types of valves connections, the requirements in DNV Rules Pt. 5 Ch. 7 – Liquefied gas tankers, Section 5 shall be observed.

Type Approval documentation

Type Approval Application dated on 2022-08-02

Type Approval Assessment Report dated on 2022-10-19

Table of overview

Drawings Nr.:

08732-XX_cryogenic strainer dated on 2020-04-22

08417-DN200-000X (DN200) dated on 2018-03-07

08417 -X- 0XXX (DN10 – DN150) dated on 2022-04-02

08416-X-0XXX (DN10 - DN50) dated on 2016-02-11

08717-X-000X (DN10 - DN150) dated 2020-04-02

08716 -DNXX (DN10 - DN50) dated on 2020-02-24

08432-X-00XX (DN15 – DN150) dated on 2018-03-07

Manufacturers catalogue "Strainers"

Test report from TÜV Nord dated 30.11.2005

Manufacturers burst test report

Tests carried out

Burst test of housing

Production testing

1. Application for Liquefied gas tankers

1. Certification of valves [DN ≥ 100 or Working temperature < -55°C]

For all valves having a nominal diameter DN ≥ 100 or a working temperature below -55°C a Product Certificate (PC) shall be issued by DNV based on the following scope of tests and according to: DNV Rules Part 5, Chapter 7 – Liquefied gas tankers, Section 5, Item 13.1.1 and 13.1.2.

<u>Type of test</u>	<u>Test pressure</u>
Shell strength	1,5 times the design pressure
Seat and stem tightness test	1,1 times the design pressure
Functional test	Design / work pressure

Pt. 5 Ch. 7, Section 1, Table 7 – Certification of components

<u>DN ≥ 100 or Working temperature < -55°C</u>	<u>Type of certificate / Issued by</u>
	VL Certificate / DNV

2. Additional cryogenic testing – 10 % of each type and size of valve

In addition, cryogenic testing consisting of valve operation and leakage verification for a minimum of 10% of each type and size of valve intended to be used at a working temperature below -55°C shall be carried out.

3. Material certification of valves working temperature < -55°C

DNV Rules Part 5, Chapter 7 – Liquefied gas tankers

Pt. 5 Ch. 7, Section 1, Table 8 – Certification of material quality and testing

Material certificates of valve bodies

<u>Valve nominal diameter</u>	<u>Type of Certificate / Issued by</u>
DN > 100	VL Certificate / DNV
DN ≤ 100	W Works Certificate / Manufacturer

4. Certification of valves [Working temperature ≥ -55°C]

For all valves intended for use at a working temperature ≥ -55°C a works certificate has to be issued based on the tests listed above and according to DNV Rules Part 5, Chapter 7 – Liquefied gas tankers, Section 1

<u>Valve nominal size</u>	<u>Type of certificate / Issued by</u>
DN < 100 mm	W Works Certificate / Manufacturer

Material certificates (valve bodies)
 W Works Certificate, issued by Manufacturer

Production testing – continuation

II. Application in machinery piping systems

Valves intended to be installed in piping system listed in DNV Rules Pt.4, Ch.6 – Section 1 shall be certified according to DNV Rules Pt.4 Ch.6 – Piping systems, Section 9

Valve nominal size / Pressure rating

DN > 100 mm / PN > 16 bar

DN ≤ 100 mm / PN ≤ 16 bar

Ship side valves DN > 100 mm
regardless of pressure rating

Type of certificate / Issued by

VL Certificate / DNV

W Works Certificate / Manufacturer

VL Certificate / DNV

Material certificates (valve bodies)

In accordance with DNV Rules Pt.4 Ch.6 – Piping systems, Section 2 – Table 3

Note:

Valves having a nominal diameter DN >100 and to be fabricated with a design temperature > 400°C shall provide VL material certificates for valve body and bolts.

Marking of product

For traceability to this type approval the strainers are to be marked with:

- Manufacturers name or trade mark
- Type designation
- Size
- Maximum design pressure and temperature
- Arrow to indicate direction

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with.

Refer to DNV CP-0338, Sec.4.

The certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>

END OF CERTIFICATE