

**TYPE APPROVAL CERTIFICATE**

**This is to certify:**

**That the Check Valve**

with type designation(s)  
**05414, 05417, 05419, 05714, 05717, 05719**

Issued to  
**Herose GmbH Armaturen und Metalle**  
**Bad Oldesloe, Schleswig-Holstein, Germany**

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

**Application :**

**Check valves for liquefied gas**  
**Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**

<b>Type:</b>	<b>Temperature range:</b>	<b>Max. working press.:</b>	<b>Sizes:</b>
<b>05414</b>	<b>-196°C to +120°C</b>	<b>PN 50, PN 40 (DN 150), PN 25 (DN200)</b>	<b>DN 10 to DN 200</b>
<b>05417</b>	<b>-196°C to +120°C</b>	<b>PN 50</b>	<b>DN 10 to DN 50</b>
<b>05419</b>	<b>-196°C to +120°C</b>	<b>PN 40</b>	<b>DN 15 to DN 150</b>
<b>05714</b>	<b>-255°C to +120°C</b>	<b>PN 50, PN 40 (DN 150)</b>	<b>DN 10 to DN 150</b>
<b>05717</b>	<b>-255°C to +120°C</b>	<b>PN 50</b>	<b>DN 10 to DN 50</b>
<b>05719</b>	<b>-255°C to +120°C</b>	<b>PN 40</b>	<b>DN 25 to DN 150</b>

Issued at **Hamburg** on **2020-09-02**

for **DNV GL**

This Certificate is valid until **2025-09-01**.

DNV GL local station: **Essen**

Approval Engineer: **Guido Friederich**

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**Olaf Drews**  
**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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.



Job Id: **262.1-027981-2**  
Certificate No: **TAP00000K3**  
Revision No: **2**

## Product description

### Type 05414:

Butt weld or socket weld connection or stainless-steel stubs according to DIN EN ISO 1127 or ASTM A312

Spring loaded closing mechanism designed to open at approx. 0.1 bar

#### Materials:

Body:	Mat.No. 1.4308	ASTM A351 CF8
Valve seal up to DN50:	PTFE/Carbon filled 25%	
Valve seal from DN 65:	PTFE	
Disc	Mat.No. 1.4301	ASTM A276 Grade 304
Spring:	Mat.No. 1.4571	ASTM A313 Grade 316 Ti
Bonnet gasket:	PTFE	
Bolts:	Mat.No. 1.4301/A2	ASTM A194 B8
Cap	Mat.No. 1.4301	ASTM A276 Grade 304

Size range: DN 10, 15, 20, 25, 32, 40, 50, 65, 80, 100, 150 and 200

### Type 05417:

Spring loaded closing mechanism designed to open at approx. 0.1 bar

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
Valve seal	PTFE / Carbon filled (25%)	
Disc	Mat.No. 1.4301	ASTM A276 Grade 304
Spring:	Mat.No. 1.4571	ASTM A313 Grade 316 Ti
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 and 50

### Type 05419:

Flanged connection acc. to DIN EN 1092-1 PN40 or ANSI B16.5 Class 150/ 300

Spring loaded closing mechanism designed to open at approx. 0.1 bar

#### Materials:

Body:	Mat.No. 1.4308	ASTM A351 CF8
Valve seal up to DN50:	PTFE/Carbon filled 25%	
Valve seal from DN 65:	PTFE	
Disc	Mat.No. 1.4301	ASTM A276 Grade 304
Spring:	Mat.No. 1.4571	ASTM A313 Grade 316 Ti
Bonnet gasket:	PTFE	
Bolts:	Mat.No. 1.4301/A2	ASTM A194 B8
Cap	Mat.No. 1.4301	ASTM A276 Grade 304

Size range: DN 15, 20, 25, 40, 50, 65, 80, 100 and 150

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## Product description - continuation

### Type 05714:

Butt weld or socket weld connection or stainless-steel stubs according to DIN EN ISO 1127 or ASTM A312

Spring loaded closing mechanism designed to open at approx. 0.1 bar

#### Materials:

Body:	Mat.No. 1.4409,	ASTM A351 CF3M
Valve seal up to DN50:	PTFE/Carbon filled 25%	
Valve seal from DN 65:	PTFE	
Disc	Mat.No. 1.4404	ASTM A276 Grade 316L
Spring:	Mat.No. 1.4571	ASTM A313 Grade 316 Ti
Bonnet gasket:	Graphite	
Bolts:	Mat.No. 1.4571/A4	ASTM A194 B8T
Cap	Mat.No. 1.4404	ASTM A276 Grade 316L

Size range: DN 10, 15, 20, 25, 32, 40, 50, 65, 80, 100 and 150

### Type 05717:

Female thread connection (G) acc. to ISO 228/1, (R) acc. to ISO 7-Rc, NPT acc. to ANSI B 1.20.1

Spring loaded closing mechanism designed to open at approx. 0.1 bar

#### Materials:

Body:	Mat.No. 1.4409,	ASTM A351 CF3M
Valve seal up to DN50:	PTFE/Carbon filled 25%	
Valve seal from DN 65:	PTFE	
Disc	Mat.No. 1.4404	ASTM A276 Grade 316L
Spring:	Mat.No. 1.4571	ASTM A313 Grade 316 Ti
Bonnet gasket:	Graphite	
Bolts:	Mat.No. 1.4571/A4	ASTM A194 B8T
Cap	Mat.No. 1.4404	ASTM A276 Grade 316L

Size range: DN 10, 15, 20, 25, 40, 50

### Type 05719:

Spring loaded closing mechanism designed to open at approx. 0.1 bar

Flanged connection acc. to DIN EN 1092-1 PN40 or ANSI B16.5 Class150 / 300

#### Materials:

Body:	Mat.No. 1.4409,	ASTM A351 CF3M
Valve seal up to DN50:	PTFE/Carbon filled 25%	
Valve seal from DN 65:	PTFE	
Disc	Mat.No. 1.4404	ASTM A276 Grade 316 L
Spring:	Mat.No. 1.4571	ASTM A313 Grade 316 Ti
Bonnet gasket:	Graphite	
Bolts:	Mat.No. 1.4571/A4	ASTM A194 B8T
Cap	Mat.No. 1.4404	ASTM A276 Grade 316L

Size range: DN 15, 20, 25, 40, 50, 65, 80, 100 and 150

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## Application

May be used for air, nitrogen gases, cryogenic liquified gases including LNG.  
Working temperature: -196°C to +120°C; Types 05714, 05717 and 05719 -255°C to +120°C  
Rating: PN50, PN 40 (DN 100, DN 150) ; ANSI Class 150 / 300

## Limitation

Valves 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 on board of DNV GL classed liquefied gas tankers and in ship's LNG and gas fuel systems.

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 GL 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 valve connections the requirements in DNV GL Rules Pt. 5 Ch. 7 – Liquefied gas tankers, Section 5 shall be observed.

## Type Approval documentation

Test report from TÜV Nord dated 04.10.2007 and 25.02.2005

## Tests carried out

Burst test

Job Id: **262.1-027981-2**  
Certificate No: **TAP00000K3**  
Revision No: **2**

## Production testing

### I. **Application for Liquefied gas tankers**

1. Certification of valves [ DN  $\geq$  100 or Working temperature  $<$  -55°C]  
For all valves having a nominal Diameter DN  $\geq$  100 or a working temperature below -55°C a product certificate has to be issued by DNV GL based on the following scope of tests and according to:  
DNV GL Rules Part 5, Chapter 7 – Liquefied gas tankers, Section 5, Item 13.2

<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

DN $\geq$ 100 or Working temperature $<$ -55°C	<u>Type of certificate / Issued by</u> VL Certificate / DNV GL
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2. Additional cryogenic testing – 10 % of the batch  
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 GL 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 GL
DN $\leq$ 100	W Works Certificate / Manufacturer

4. Certification of valves [ Working temperature  $\geq$  -55°C]  
For all valves intended for use at a working temperature  $\geq$  -55°C a works certificate has to be issued based on the tests listed above and according to  
DNV GL 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

Job Id: **262.1-027981-2**  
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Revision No: **2**

## Production testing- continuation

### II. Application in machinery piping systems

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

W Works Certificate / Manufacturer

VL Certificate / DNV GL

#### Material certificates (valve bodies)

In accordance with DNV GL 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 valves are to be marked with:

- Manufacturer's name and/or trademark
- Valve type designation
- Valve size
- Design pressure
- Design temperature

## Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment as per DNVGL-CP-0338, Sec.4 to verify that the conditions for the Type Approval are complied with.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>.

**END OF CERTIFICATE**