

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.4 Ch.6 Piping systems
DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves
DNV GL offshore standards

Application :

Check valves for liquefied gas.

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

For installation on Offshore units the requirements specified in the applicable DNV GL rules for classification of Offshore units (RU-OU) are to be observed.

Type:	Temperature range:	Max. working press.:	Sizes:
05414	-196°C to +120°C	PN 50, PN 40 (DN100, DN 150)	DN 10 to DN 150
05417	-196°C to +120°C	PN 50	DN 10 to DN 50
05419	-196°C to +120°C	PN 40	DN 15 to DN 150
05714	-255°C to +120°C	PN 50, PN 40 (DN 100, DN 150)	DN 10 to DN 150
05717	-255°C to +120°C	PN 50	DN 10 to DN 50
05719	-255°C to +120°C	PN 40	DN 25 to DN 150

This Certificate is valid until **2022-01-30**.

Issued at **Hamburg** on **2017-01-31**

DNV GL local station: **Hamburg**

for **DNV GL**

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.

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 and 150

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

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	

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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

Application/Limitation

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 for installation in systems operating with flammable gases and fluids including cryogenic liquefied gases (LPG/LNG) 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 with parallel thread are not allowed for pipe connections within pipe class I.
 - Threaded joints with tapered joints 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.

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- Threaded joints in CO2 systems shall be allowed only inside protected spaces and in CO2 cylinder rooms.
- Threaded joints with parallel thread shall be allowed for Class III, outside diameter not more than 60,3 mm.

Type Approval documentation

Tests carried out

Burst test

Marking of product

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

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

Periodical assessment

A condition for retention of the Type Approval Certificate in its validity period is that periodical assessments are successfully carried out.

The objective of the periodical assessment is to verify that the conditions for the type approval have not been altered. The main scope of the periodical assessment will normally include:

- Verification of the TA applicant's production and quality system w.r.t ensuring continued consistent production of the type approved products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the TA documentation and that this is still used as a basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking

END OF CERTIFICATE