Certificate no.:
TAP0000355

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Safety Valve

with type designation(s)
06011, 06012, 06016, 06383, 06413, 06440, 06441, 06445, 06446

issued to
HEROSE GMBH 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.4 Ch.7 Pressure equipment
DNV rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV rules for classification – Ships Pt.6 Ch.2 Sec.6 Low flashpoint liquid fuelled engines – LFL fuelled
DNV rules for classification – Ships Pt.6 Ch.2 Sec.14 Gas fuelled ship installations – Gas fuelled ammonia
DNV class programme DNV-CP-0186 – Type approval – Valves

Application:

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

K. factor: **see certificate**

Issued at **Hamburg** on **2026-06-08**

This Certificate is valid until **2031-06-07**.
DNV local unit: **Hamburg – CMC North/East**

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

for **DNV**

Digitally Signed By:
Sven Klinger
Location: DNV Hamburg, Germany

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

Cryogenic Safety Valve type: 06011, 06012, 06016, 06383, 06413, 06440, 06441, 06445, 06446 for applications in various cryogenic medium: LNG, Methanol and Ammonia piping system installations.

Type 06011:
Spring loaded 90° angle type, carbon filled PTFE valve seat, closed bonnet.

Working temperature: -255 [°C] to +65 [°C]

Working pressure range: 5 – 55 [bar]

Nominal sizes: ¼", 3/8", ½"

K-values:

¼"	3/8"	½"
0.09	0.09	0.09

Materials:

Valve parts	Material	Standard
Body	1.4408	ASTM A351 CF8M
Disc	PTFE/Carbon filled (25%)	
Stem	1.4305	ASTM A314 Grade 303
Seat	PTFE / 25% carbon	-

Three types of inlet connection: [*See Limitation*]
1. Male thread type R (BSPT) acc. to ISO 7/1
2. Male thread type G (BSPP) acc to ISO 228/1
3. Male thread NPT acc. to ANSI B 1.20.1

Type 06012 and 06016:
Spring loaded 90° angle type, carbon filled PTFE valve seat, closed bonnet. 06016 with manual lifting device.

Working temperature: -255 [°C] to +150 [°C]

Working pressure range: 1 – 55 [bar]

Nominal sizes: ¼", 3/8", ½"

K-values:

¼"	3/8"	½"
0.42	0.42	0.42

Materials:

Valve parts	Material	Standard
Body	1.4408	ASTM A351 CF8M
Disc	1.4301	ASTM A479 Grade 304
Stem	1.4301	ASTM A479 Grade 304
Seat	PTFE / 25% carbon	-

Three types of inlet connection: [*See Limitation*]
1. Male thread type R (BSPT) acc. to ISO 7/1
2. Male thread type G (BSPP) acc. to ISO 228/1
3. Male thread NPT acc. to ANSI B 1.20.1

Type 06383 and 06413:
Spring loaded 90° angle type, carbon filled PTFE valve seat, full lift type, closed bonnet. 06413 with manual lifting device. The inlet is threaded to the outlet body.

Working temperature: -255 [°C] to +185 [°C] **Type 06383**
Working temperature: -196 [°C] to +185 [°C] **Type 06413**

Working pressure range: 2 – 50 [bar]

Nominal sizes: ½", ¾", 1", 1 ¼", 1 ½" and 2"

K-values:

½" orifice 7.0	½" orifice 10.5	¾" orifice 7.0	¾" orifice 10.5	1" 15	1 ¼" 23	1 ½" 23	2" 23
0.82	0.58	0.82	0.58	0.5	0.62	0.62	0,62

Materials:

Valve parts	Material	Standard
Outlet body	1.4308	ASTM A351 CF8
Inlet body	1.4301 1.4404	ASTM A479 Grade 304 ASME SA 276 Grade 316L
Disc	1.4301	ASTM A479 Grade 304
Stem	1.4301	
Seat	PTFE / 25% carbon	-

Four types of inlet/outlet connection: [*See Limitation*]
1. Inlet: Male thread type G (BSPP) acc to ISO228/1, Outlet: Female thread type G (BSPP) acc to ISO228/1
2. Inlet: Male thread type R (BSPT) acc to ISO 7/1, Outlet: Female thread type G (BSPP) acc to ISO228/1
3. Inlet: Male thread NPT acc. to ANSI B 1.20.1 Outlet: Female thread type G (BSPP) acc to ISO228/1
4. Inlet: Male thread NPT acc. to ANSI B 1.20.1 Outlet: Female thread type NPT acc to ANSI B 1.20.1

Type 06440, 06441, 06445 and 06446:
Spring loaded 90° angle type, PCTFE valve seat, closed bonnet.
The inlet is threaded to the outlet body.

Working temperature: -255 [°C] to +185 [°C]

Working pressure range: 0,4 – 50 [bar]

Nominal sizes: ½", ¾", 1", and 1 ¼"

K-values:

½" orifice 7.0	¾" orifice 7.0	½" orifice 10.5	¾" orifice 10.5	¾" orifice 14.0	1" orifice 14.0	1" orifice 18.0	1 ¼" orifice 18.0	1 ¼" orifice 23.0
0.78	0.78	0,69	0.69	0,66	0.66	0.66	0.66	0.54

Materials:

Valve parts	Material	Standard
Outlet body	1.4308	ASTM A351 CF8
Inlet body	1.4301	ASTM, A479 Grade 304
	1.4571	ASME SA 479 Grade 316Ti
	1.4404	ASME SA 479 Grade 316L
Disc	1.4571	ASTM A479 Grade 316Ti
Seat	PCTFE or 1.4571(metallic sealing, for d0=7mm only)	-

Type 06440
Four types of inlet/outlet connection: [*See Limitation*]
1. Inlet: Male thread type G (BSPP) acc to ISO228/1,
   Outlet: Female thread type G (BSPP) acc to ISO228/1
2. Inlet: Male thread type R (BSPT) acc to ISO 7/1,
   Outlet: Female thread type G (BSPP) acc to ISO228/1
3. Inlet: Male thread NPT acc. to ANSI B 1.20.3,
   Outlet: Female thread type G (BSPP) acc to ISO228/1
4. Inlet: Male thread NPT acc. to ANSI B 1.20.3,
   Outlet: Female thread type NPT acc to ANSI B 1.20.3

Type 06441
Inlet/outlet connection: [*See Limitation*]
Inlet and outlet: Female thread type G (BSPP) acc to ISO228/1

Type 06445:
Four types of inlet/outlet connection: [*See Limitation*]

1. Inlet: Male thread type G (BSPP) acc to ISO228/1,
   Outlet: Female thread type G (BSPP) acc to ISO228/1
2. Inlet: Male thread type R (BSPT) acc to ISO 7/1,
   Outlet: Female thread type G (BSPP) acc to ISO228/1
3. Inlet: Male thread NPT acc. to ANSI B 1.20.3,
   Outlet: Female thread type G (BSPP) acc to ISO228/1
4. Inlet: Male thread NPT acc. to ANSI B 1.20.3,
   Outlet: Female thread type NPT acc to ANSI B 1.20.3

Type 06446:

Inlet/outlet connection: [*See Limitation*]
Inlet and outlet: Female thread type G (BSPP) acc to ISO228/1

Application

Safety relief valves for air, gases, vapours, cryogenic liquefied gases.

Limitation

Stainless steel safety valve types: 06011, 06012, 06016, 06383, 06413, 06440, 06441, 06445, 06446 approved for the use in ships piping, machinery piping, fuel systems and cargo handling piping systems. Operating media include flammable gases and cryogenic liquefied gases including LNG.

Stainless steel safety valve types: 06011, 06012, 06016, 06383, 06413, 06440, 06441, 06445, 06446 in this approval certificate has a connection between pipe lengths and pressure equipment, up to 25 mm.

Valves are not approved for liquid and gaseous hydrogen and for media specified as toxic and/or dangerous fluids.[1]

Note[1]: See United Nations (UN) Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

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.

The installation of safety valves in pressurized systems has to be observed under consideration of the specific operating conditions, type of flowing media and observation of the applicable DNV Rules and Pipe Classes.

Tests carried out

Flow test, Seat and leakage test, Cryogenic test

Type Approval documentation

Type approval Application dated 2025-09-16
Herose test plan for cryogenic safety valves performed at markers test lab on 2015-06-25 according to DIN EN 4126 / API 527 witnessed by Lloyds Register on 2015-06-25 and 2015-07-09 accepted based on the old Type approval Certificate TAP00000MJ
Drawings: 06011-X-X000; 06012-X-X000; 06016-X-X000; 06383-X-X00; 06413-X-X00; 06440-X-X00; 06441-X-X00; 06445-X-X00; 06446-X-X00
Technical specification safety valve – Herose: Rev.02; BS SIVE 1111; 06001series – Rev.00

Production testing and Certification

Production Testing and Certification for the actual intended application shall follow the latest applicable edition of the Rules (as mentioned on the front page of this certificate).

Valve type approval tests carried out[1]

Type of test	Test standard
Determination of discharge coefficient	DIN EN ISO 4126-1
Verification of discharge capacity	
Hydraulic pressure test of the valve housing Test pressure = 1,5 times the design pressure	
Check of set pressure and reset pressure at room temperature	
Tightness test	API527

Note[1]: Tests were for cryogenic safety valves performed at markers test lab on 2015-06-25 according to DIN EN ISO 4126-1/ API 527 witnessed by Lloyds Register on 2015-06-25 and 2015-07-09.

Each safety relief valve is subject to production testing according to the applicable DNV Rules as following:
Part 4, Chapter 6 – Piping systems, Section 9 - Valves
Part 4, Chapter 7 – Pressure equipment, Section 5 and Section 7

Place of Production

HEROSE GMBH Armaturen und Metalle
Elly-Heuss-Knapp-Str.12
23843 Bad Oldesloe Germany

Marking of product

Each valve shall be clearly marked for identification. The identification marking may be performed on the body or on a plate of non-corrosive material. When a metallic plate is used, the plate shall be permanently fixed to the body. Identification marking on the body shall be located to non-stressed areas and shall be clearly legible.
The identification marking shall as a minimum include the following:

- Manufacturer's name or trademark
- Valve type designation
- Size
- Maximum design pressure and temperature
- Arrow to indicate direction of flow on one-way flow valves

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