

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve for Liquefied Gas**with type designation(s)
Gate Valves

Issued to

AMPO
Idiazabal, Guipuzcoa, Spain

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**Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**Issued at **Høvik** on **2021-01-27**for **DNV GL**This Certificate is valid until **2025-12-30**.DNV GL local station: **Area NB/CMC Iberia**Approval Engineer: **Sarah Miller**

Zeinab Sharifi
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.

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TYPE APPROVAL CERTIFICATE

This is to certify:**That the Valve for Liquefied Gas**with type designation(s)
Globe Valves

Issued to

AMPO
Idiazabal, Guipuzcoa, Spain

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**Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**Issued at **Høvik** on **2021-01-27**for **DNV GL**This Certificate is valid until **2025-12-30**.DNV GL local station: **Area NB/CMC Iberia**Approval Engineer: **Sarah Miller**

Zeinab Sharifi
Head of Section

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Job Id: **262.1-004551-9**
Certificate No: **TAP00000NV**
Revision No: **1**

Product description

Stainless steel globe valves with extended stem. Flanged or butt welded type.

Material:

Body: ASTM A351 CF8M/CF3M
Bonnet: ASTM A351 CF8M/CF3M
Ball: ASTM A479 Gr.316
Stem: ASTM A479 Gr.316
Gland Bushing/Flange: ASTM A479 Gr. 316/ASTM A 240 Gr. 304
Stud Bolt: ASTM A 193.Gr.B8
Nut: ASTM A 194.Gr. 8
Gasket and packing: GRAPHOIL, GRAPHOIL+316 SS

Application/Limitation

Valves covered by this certificate may be used in LNG/LPG applications in below design conditions:

Service : Liquefied Gas - Cryogenic Service
Temperature range : Room temperature : +24°C down to -196°C

| Pressure ratings (ANSI Class) | Sizes (inches) |
|-------------------------------|---|
| 150 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16 |
| 300 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12 |
| 600 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12 |
| 900 | 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12 |

Max. working pressure according to ASME B16.34, table 2-2.2 for group 2.2 materials for the relevant pressure class.

Flanges are according to ANSI B16.5

Type Approval documentation

- Test reports for all sizes
- Drawing nos for all sizes

Tests carried out

Pneumatic and Hydrostatic leakage test (seat and body), Cryogenic leakage (seat and body) and functional test, Fire Test

Production testing

Each valve body shall be subjected to a hydrostatic pressure test at;

- 1.5 times the allowable pressure at room temperature

In addition, each valve shall be subject to seat leakage testing as follows:

- 1.1 times the design pressure in the valve flow direction.
- 5 bar applied independently on each side of the disc.

Testing shall follow procedures and acceptance criteria in EN 12266-1 (leakage rate A).

For cryogenic valves:

Job Id: **262.1-004551-9**
Certificate No: **TAP00000NV**
Revision No: **1**

In addition to the above tests, cryogenic testing consisting of valve operation and leakage verification (to BS6364) 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 undertaken (DNV GL Ship P.5 Ch.7. Sec.5 [13.1.1])

Production testing for valves that require DNV GL product certificate shall be witnessed by DNV GL surveyor.

Certification

LNG/LPG applications:

The valves shall be delivered with DNV GL product certificate when minimum design temperature is less than -55°C or $DN \geq 100$. Otherwise manufacturer's product certificate may be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.5 Ch.7 Sec.1 Table 8. Approval of manufacturer is required for VL and W material certificates.

Other applications:

The Society's product certificates are required for valves with $DN > 100$ mm having a design pressure, $p > 16$ bar and for ship side valves with $DN > 100$ mm regardless of pressure rating. For other valves, works certificate will be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL and W material certificates.

Marking of product

For traceability to this type approval each valve is at least to be marked with:

- manufacturer's name or trade mark
- 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 GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.



Certificate No:
TAP00002BV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve for Liquefied Gas

with type designation(s)
Cryogenic Lift Check Valves

Issued to
AMPO S.C.
Idiazabal, Guipuzcoa, Spain

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

Application :

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

Issued at **Høvik** on **2021-11-09**

for **DNV**

This Certificate is valid until **2026-11-08**.

DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Maheshraja Venkatesan**

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Zeinab Sharifi
Head of Section

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Job Id: **262.1-004551-8**
Certificate No: **TAP00000NB**
Revision No: **1**

Product description

Stainless steel gate valves with extended stem. Flanged or butt welded type.

Material:

Body: ASTM A351 CF8M/CF3M
Bonnet: ASTM A351 CF8M/CF3M
Ball: ASTM A479 Gr.316
Stem: ASTM A479 Gr.316
Gland Bushing/Flange: ASTM A479 Gr. 316/ASTM A 240 Gr. 304
Stud Bolt: ASTM A 193.Gr.B8
Nut: ASTM A 194.Gr. 8
Gasket and packing: GRAPHOIL, GRAPHOIL+316 SS

Application/Limitation

Valves covered by this certificate may be used in LNG/LPG applications in below design conditions:

Service : Liquefied Gas - Cryogenic Service
Temperature range : Room temperature : +24°C down to -196°C

| Pressure ratings (ANSI Class) | Sizes (inches) |
|-------------------------------|--|
| 150 | 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24 |
| 300 | 1/2, 3/4, 1, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24 |
| 600 | 1/2, 3/4, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24 |
| 900 | 3, 4, 6, 8, 10, 12, 16, 18 |

Max. working pressure according to ASME B16.34, table 2-2.2 for group 2.2 materials for the relevant pressure class.

Flanges are according to ANSI B16.5

Type Approval documentation

- Test reports for all sizes
- Drawing nos for all sizes

Tests carried out

Pneumatic and Hydrostatic leakage test (seat and body), Cryogenic leakage (seat and body) and functional test, Fire Test

Production testing

Each valve body shall be subjected to a hydrostatic pressure test at;

- 1.5 times the allowable pressure at room temperature

In addition, each valve shall be subject to seat leakage testing as follows:

- 1.1 times the design pressure in the valve flow direction.
- 5 bar applied independently on each side of the disc.

Testing shall follow procedures and acceptance criteria in EN 12266-1 (leakage rate A).

For cryogenic valves:

In addition to the above tests, cryogenic testing consisting of valve operation and leakage verification (to BS6364) 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 undertaken (DNV GL Ship P.5 Ch.7. Sec.5 [13.1.1])

Job Id: **262.1-004551-8**
Certificate No: **TAP00000NB**
Revision No: **1**

Production testing for valves that require DNV GL product certificate shall be witnessed by DNV GL surveyor.

Certification

LNG/LPG applications:

The valves shall be delivered with DNV GL product certificate when minimum design temperature is less than -55°C or $\text{DN} \geq 100$. Otherwise manufacturer's product certificate may be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.5 Ch.7 Sec.1 Table 8. Approval of manufacturer is required for VL and W material certificates.

Other applications:

The Society's product certificates are required for valves with $\text{DN} > 100$ mm having a design pressure, $p > 16$ bar and for ship side valves with $\text{DN} > 100$ mm regardless of pressure rating. For other valves, works certificate will be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL and W material certificates.

Marking of product

For traceability to this type approval each valve is at least to be marked with:

- 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 GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.



Certificate No:
TAP00002BV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve for Liquefied Gas

with type designation(s)
Cryogenic Lift Check Valves

Issued to
AMPO S.C.
Idiazabal, Guipuzcoa, Spain

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

Application :

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

Issued at **Høvik** on **2021-11-09**

for **DNV**

This Certificate is valid until **2026-11-08**.

DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Maheshraja Venkatesan**

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Zeinab Sharifi
Head of Section

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TYPE APPROVAL CERTIFICATE**This is to certify:****That the Valve for Liquefied Gas**with type designation(s)
Check Valves

Issued to

AMPO**Idiazabal, Guipuzcoa, Spain**

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****Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**Issued at **Høvik** on **2021-01-27**for **DNV GL**This Certificate is valid until **2025-12-30**.DNV GL local station: **Area NB/CMC Iberia**Approval Engineer: **Sarah Miller****Zeinab Sharifi**
Head of Section

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Job Id: **262.1-004551-11**
Certificate No: **TAP00000NW**
Revision No: **1**

Product description

Stainless steel swing type check valve. Flanged or butt welded type.

Material:

Body: ASTM A351 CF8M/CF3M
Disc: ASTM A351 CF3M/CF8M+Stell-6
Bonnet: ASTM A351 CF8M/CF3M
Body Bonnet Gasket: Spiral Wound 316+ GRAPHOIL
Nut: ASTM A 479 Gr. 316
Washer/Disc Pin: ASTM A 479 Gr. 316

Application/Limitation

Valves covered by this certificate may be used in LNG/LPG applications in below design conditions:

Service : Liquefied Gas - Cryogenic Service
Temperature range : Room temperature : +24°C down to -196°C

| Pressure ratings (ANSI Class) | Sizes (inches) |
|-------------------------------|---|
| 150 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24 |
| 300 | 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18 |
| 600 | 1/2, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 14, 16, 18 |
| 900 | 2, 3, 4, 6, 8, 10, 12, 14, 16 |

Max. working pressure according to ASME B16.34, table 2-2.2 for group 2.2 materials for the relevant pressure class.

Flanges are according to ANSI B16.5

Type Approval documentation

- Test reports for all sizes
- Drawing nos for all sizes

Tests carried out

Pneumatic and Hydrostatic leakage test (seat and body), Cryogenic leakage (seat and body) and functional test, Fire Test

Production testing

Each valve body shall be subjected to a hydrostatic pressure test at;

- 1.5 times the allowable pressure at room temperature

In addition, each valve shall be subject to seat leakage testing as follows:

- 1.1 times the design pressure in the valve flow direction.
- 5 bar applied independently on each side of the disc.

Testing shall follow procedures and acceptance criteria in EN 12266-1 (leakage rate A).

For cryogenic valves:

In addition to the above tests, cryogenic testing consisting of valve operation and leakage verification (to BS6364) 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 undertaken (DNV GL Ship P.5 Ch.7. Sec.5 [13.1.1])

Production testing for valves that require DNV GL product certificate shall be witnessed by DNV GL surveyor.

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Valve for Liquefied Gas**with type designation(s)
Ball Valves

Issued to

AMPO**Idiazabal, Guipuzcoa, Spain**

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**Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**Issued at **Høvik** on **2021-02-02**for **DNV GL**This Certificate is valid until **2025-12-30**.DNV GL local station: **Area NB/CMC Iberia**Approval Engineer: **Sarah Miller****Zeinab Sharifi**
Head of Section

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Job Id: **262.1-004551-10**
Certificate No: **TAP00000NX**
Revision No: **2**

Product description

Stainless steel ball valves with extended stem. Flanged or butt welded connection. Top entry or split body.

Material:

| | |
|----------------------|--|
| Body | ASTM A351 CF8M/CF3M |
| Bonnet | ASTM A351 CF8M/CF3M |
| Ball | ASTM A351 CF8M/CF3M |
| Stem | ASTM A479 Gr.316 |
| Gland Bushing/Flange | ASTM A479 Gr. 316/ASTM A 240 Gr. 304 |
| Stud Bolt | ASTM A 320.Gr.8 Class 2 |
| Nut | ASTM A 194.Gr. 8 |
| Gasket and packing | RPTFE, GRAPHOIL, GRAPHOIL+ Spiral Wound SS 316 |

Application/Limitation

Valves covered by this certificate may be used in LNG/LPG applications in below design conditions:

Service : Liquefied Gas - Cryogenic Service
Temperature range : Room temperature: +24°C down to -196°C

| Pressure ratings (ANSI Class) | Sizes (inches) |
|-------------------------------|---|
| 150 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24 |
| 300 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 16, 18, 20, 24 |
| 600 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24 |
| 900 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 24 |
| 1500 | 1/2, 3/4, 1, 1 1/2, 2, 3, 4, 6, 8, 10, 12, 14, 16, 20 |

Max. working pressure according to ASME B16.34, table 2-2.2 for group 2.2 materials for the relevant pressure class. Flanges are according to ANSI B16.5

Type Approval documentation

- Test reports for all sizes
- Drawing nos for all sizes

Tests carried out

Pneumatic and Hydrostatic leakage test (seat and body), Cryogenic leakage (seat and body) and functional test, Fire Test.

Production testing

Each valve body shall be subjected to a hydrostatic pressure test at;

- 1.5 times the allowable pressure at room temperature

In addition, each valve shall be subject to seat leakage testing as follows:

- times the design pressure in the valve flow direction.
- 5 bar applied independently on each side of the disc.

Testing shall follow procedures and acceptance criteria in EN 12266-1 (leakage rate A).

For cryogenic valves:

In addition to the above tests, cryogenic testing consisting of valve operation and leakage verification (to BS6364) 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 undertaken (DNV GL Ship P.5 Ch.7. Sec.5 [13.1.1]).

Job Id: **262.1-004551-10**
Certificate No: **TAP00000NX**
Revision No: **2**

Certification

LNG/LPG applications:

The valves shall be delivered with DNV GL product certificate when minimum design temperature is less than -55°C or DN \geq 100. Otherwise manufacturer's product certificate may be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.5 Ch.7 Sec.1 Table 8. Approval of manufacturer is required for VL and W material certificates.

Other applications:

The Society's product certificates are required for valves with DN > 100 mm having a design pressure, p>16 bar and for ship side valves with DN > 100 mm regardless of pressure rating. For other valves, works certificate will be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL and W material certificates.

Marking of product

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

- manufacturer's name or trade mark
- valve type designation
- size
- maximum design pressure and temperature
- arrow to indicate direction of flow

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.



Certificate No:
TAP00002BV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve for Liquefied Gas

with type designation(s)
Cryogenic Lift Check Valves

Issued to
AMPO S.C.
Idiazabal, Guipuzcoa, Spain

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

Application :

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

Issued at **Høvik** on **2021-11-09**

for **DNV**

This Certificate is valid until **2026-11-08**.

DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Maheshraja Venkatesan**

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Head of Section

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Job Id: **262.1-004551-11**
Certificate No: **TAP00000NW**
Revision No: **1**

Certification

LNG/LPG applications:

The valves shall be delivered with DNV GL product certificate when minimum design temperature is less than -55°C or $DN \geq 100$. Otherwise manufacturer's product certificate may be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.5 Ch.7 Sec.1 Table 8. Approval of manufacturer is required for VL and W material certificates.

Other applications:

The Society's product certificates are required for valves with $DN > 100$ mm having a design pressure, $p > 16$ bar and for ship side valves with $DN > 100$ mm regardless of pressure rating. For other valves, works certificate will be accepted.

Valve bodies shall be delivered with material certificates in accordance with DNVGL-RU-SHIP Pt.4 Ch.6 Sec.2 Table 3. Approval of manufacturer is required for VL and W material certificates.

Marking of product

For traceability to this type approval each valve is at least to be marked with:

- manufacturer's name or trade mark
- 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 GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338.



Certificate No:
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TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve for Liquefied Gas

with type designation(s)
Cryogenic Lift Check Valves

Issued to
AMPO S.C.
Idiazabal, Guipuzcoa, Spain

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

Application :

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

Issued at **Høvik** on **2021-11-09**

for **DNV**

This Certificate is valid until **2026-11-08**.

DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Maheshraja Venkatesan**

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Certificate No:
TAP00002BV

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve for Liquefied Gas

with type designation(s)
Cryogenic Lift Check Valves

Issued to
AMPO S.C.
Idiazabal, Guipuzcoa, Spain

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

Application :

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

Issued at **Høvik** on **2021-11-09**

for **DNV**

This Certificate is valid until **2026-11-08**.

DNV local station: **Area NB/CMC Iberia**

Approval Engineer: **Maheshraja Venkatesan**

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Zeinab Sharifi
Head of Section

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Form code: TA 251

Revision: 2021-03

www.dnv.com

Page 1 of 3

Product description

Cryogenic lift check valves designed according to ASME B16.34 with butt welding ends according to ASME B16.25 Sch. 80S comprising of following variants:

| <i>Sizes covered</i> | <i>Pressure rating</i> |
|---------------------------|------------------------|
| 1/2", 3/4", 1 1/2" and 2" | Class 150 |
| 1 1/2" and 2" | Class 600 |

Valve production testing standard: API 598

Material of construction:

| <i>Part</i> | <i>Material grade</i> |
|-----------------------|-------------------------------|
| Body | : ASTM A351 Cf8M/ CF3M |
| Bonnet | : ASTM A479 Gr. 316L |
| Disc | : ASTM A479 Gr. 316L |
| Body bonnet gasket | : Spiral wound 316 + graphite |
| Body bonnet stud bolt | : ASTM A320 B8M Cl.2 |

Application/Limitation

Valves covered by this certificate are approved to be used in LNG/LPG applications - Cryogenic Service.

Design temperature: -196°C to +50°C

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions. Valves of austenitic stainless steel shall not be used in direct contact with seawater.

The valves covered by this certificate are not to be considered fire safe and therefore shall not be installed wherever fire safe application is required; e.g. as shut off or quick closing valves.

Type Approval documentation

| <u>Document No.</u> | <u>Rev.</u> | <u>Title</u> |
|---------------------|-------------|--|
| 191091011 | 1 | Cryogenic lift check valve BW size 1/2", rating 150 lbs |
| 191091009 | 1 | Cryogenic lift check valve BW size 1 1/2", rating 150 lbs |
| 191091164 | 1 | Cryogenic lift check valve BW size 2", rating 150 lbs |
| 191091094 | 1 | Cryogenic lift check valve BW size 3/4", rating 150 lbs |
| 191091096 | 1 | Cryogenic lift check valve BW size 1 1/2", rating 600 lbs |
| 191091120 | 1 | Cryogenic lift check valve BW size 2" rating 600 lbs |
| 3977-1 | - | Valvula De Globo ANSI 150 LBS. DN 1/2# |
| -1 | - | Valvula De Globo ANSI 150 LBS. DN 1 1/2# |
| -1 | - | Valvula De Globo ANSI 150 LBS. DN 2# |
| 1428-1 | - | Valvula De Globo ANSI 150 LBS. DN 3/4# |
| 1817-1 | - | Valvula De Globo ANSI 600 LBS. DN 1 1/2# |
| 02779-1 | - | Valvula De Globo ANSI 600 LBS. DN 2# |
| 04474-2 | 001 | Valvula de retencion ANSI 150LBS. DN. 1/2" |
| --2 | 001 | Valvula de retencion ANSI 150LBS. DN. 11-2# |
| -2 | 001 | Valvula de retencion ANSI 150LBS. DN. 2# |
| -- | 001 | Valvula de retencion ANSI 150LBS. DN. 3-4# |
| - | - | Valvula de retencion LC ANSI 600LBS. DN.1. 1/2" |
| 02779-2 | 001 | Valvula de retencion ANSI 600LBS. DN. 2# |
| - | - | Calculations Lift check valve 150#, 1_2inch |
| - | - | Calculations Lift check valve 150#, 1-1_2inch |
| - | - | Calculations Lift check valve 150#, 2inch |
| - | - | Calculations Lift check valve 150#, 3_4inch |
| - | - | Calculations Lift check valve 600#, 1-1_2inch |
| - | - | Calculations Lift check valve 600#, 2inch |
| 191091009 n°1 | 1 | Low temperature test valve certificate witnessed by DNV dated 2020-06-08 |
| 191091136 n°1 | 1 | Low temperature test valve certificate witnessed by DNV dated 2020-06-08 |
| 191091164 n°1 | 1 | Low temperature test valve certificate witnessed by DNV dated 2020/09/22 |
| 191091094 n°1 | 1 | Low temperature test valve certificate witnessed by DNV dated 2020-06-08 |
| 191091096 n°1 | 1 | Low temperature test valve certificate witnessed by DNV dated 2020/09/22 |
| 191091120 n°1 | 1 | Low temperature test valve certificate witnessed by DNV dated 2020/09/22 |
| - | - | Bolting calculation ASME VIII Div.2, Part 4, 150#, 1_2inch |

- Bolting calculation ASME VIII Div.2, Part 4, 150#, 1-1_2inch
- Bolting calculation ASME VIII Div.2, Part 4, 150#, 2inch
- Bolting calculation ASME VIII Div.2, Part 4, 150#, 3_4inch
- Bolting calculation ASME VIII Div.2, Part 4, 600#, 1-1_2inch
- Bolting calculation ASME VIII Div.2, Part 4, 600#, 2inch
- Calculation of the bolting according to ASME VIII Div.2 Part 4 and ASME B16.34, 150#, 1_2inch
- Calculation of the bolting according to ASME VIII Div.2 Part 4 and ASME B16.34, 150#, 1-1_2inch
- Calculation of the bolting according to ASME VIII Div.2 Part 4 and ASME B16.34, 150#, 2inch
- Calculation of the bolting according to ASME VIII Div.2 Part 4 and ASME B16.34, 150#, 3_4inch
- Calculation of the bolting according to ASME VIII Div.2 Part 4 and ASME B16.34, 600#, 1-1_2inch
- Calculation of the bolting according to ASME VIII Div.2 Part 4 and ASME B16.34, 600#, 2inch
- 6008-14 - Valvula de retencion ANSI 600 LBS. DN. 1 1/2#
- 4315-14 - Valvula De Retencion ANSI 150 LBS. DN. 1 1/2#
- 1128-14 - Valvula De Retencion ANSI 150 LBS. DN. 2#
- 0128-14 - Valvula De Retencion ANSI 600 LBS. DN. 2#
- 2081-14 - Valvula De Retencion ANSI 150 LBS. DN. 3/4#
- 4081-14 - Valvula De Retencion ANSI 150 LBS. DN. 1/2#

Tests carried out

Cryogenic leakage test

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).

Marking of product

Minimum marking requirements shall be as outlined in the valve design standard.

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 approval are complied with. Reference is made to DNV-CP-0338.