

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Gate Valve**

with type designation(s)
"Clipofrost" type 3884, 3885

Issued to

SNRI S.A.S
RUFFEC, France

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
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition July 2015
DNV GL class programme DNVGL-CP-0186 – Type approval – Valves

Application :

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

Temperature range: -196°C to 80°C

Max. working press.: 12 bar (see page 2)

Sizes: DN40, DN50, DN65, DN80, DN100, DN125, DN150, DN200, DN250, DN300

Issued at **Høvik** on **2017-11-09**

This Certificate is valid until **2021-12-30**.

DNV GL local station: **Saint Nazaire**

for **DNV GL**

Approval Engineer: **Sinisa Sedlan**

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Marianne Spæren Marveng
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

Gate valves for cryogenic service.

End connections: Flanges PN20 acc. to EN 1092-1 / Flanges Class 150 acc. to ASME B16.5 (type 3884)
Butt weld ends acc. to ASME B16.25 (type 3885)

Sizes: DN40, DN50, DN65, DN80, DN100, DN125, DN150, DN200, DN250, DN300

Materials:

Body	A351 CF3M; A351 CF8M; A182 F316L
Bonnet	A351 CF3M; A351 CF8M; A182 F316L
Disc	A351 CF3M; A182 F316L / Stellite; A351 CF3M / Stellite
Stem	A182 F316L; A479 316L
Seat	A182 F316L / Stellite; A240 316L / Stellite; A479 316L / Stellite

Application/Limitation

Valves covered by this certificate may be used in under the following design conditions:

Service: General machinery service or LNG/LPG applications - Cryogenic Service
Temperature range: -196 °C to +80 °C
Max. working pressure: Depends on minimum temperature:

Minimum temperature	
< -55 °C	≥ -55 °C
10 bar	12 bar

This certificate does not cover actuators.

The valves are not to be considered fire safe.

Carbon steels and austenitic stainless steel grades (such as 304, 316, 304L and 316L) are not permitted for use in sea water systems.

Material in contact with seawater shall be properly protected. Surface preparation and coating shall be approved by society.

Type Approval documentation

Tests carried out

Cryogenic test, shell test, seat 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 at 1.1 times the design pressure in the valve flow direction.

Testing shall follow procedures and acceptance criteria in EN12266-1 (leakage rate A).

In addition to the above tests, cryogenic testing consisting of valve operation and leakage verification (to BS6364) for a minimum 10% of each type and size of valve intended to be used at working temperature below -55°C shall be undertaken. (Refrence is made DNV GL ship rules Pt.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

The valves shall be delivered with a product certificate when $T_{min} < -55^{\circ}\text{C}$ or $DN \geq 100$.
Otherwise manufacturer's certificate may be accepted.

For LNG/LPG applications: Material certificates for valve bodies are required in line with DNV GL Pt.5 Ch.7 Sec.1 Table 8.

For other applications: Material certificates for valve bodies shall be according to DNV GL Pt.4 Ch.6 Sec.2 Table 3.

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
- Type designation
- Max. design pressure or pressure class

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment every second year and before the expiry date of this certificate, to verify that the conditions for the type approval are complied with.

When possible, this assessment may be harmonised with normal surveys for product certification and / or other surveys and audits carried out.

The main elements of the certificate retention survey are:

- 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
- Review of Type Approval documentation and assurance that it is still used as basis for production
- Review of possible changes in design, materials and performance
- Assurance of traceability between manufacturer's product type marking and Type Approval Certificate.

Renewal should be applied for in writing before the certificate expires.