DNV·GL

Certificate No:
TAP00000HF

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Valve for Liquefied Gas

with type designation(s)
Manually Operated Cryogenic Needle Valves

Issued to
Hy-Lok Corporation (Kangseo Factory)
Busan, Republic of Korea

is found to comply with
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 all vessels classed by DNV GL.

Temperature range:	**-196°C to 38°C**
Max. working press.:	**10 bar**
Sizes and types:	**1/2" (DN 15):** **CRYONC-8FA, CRYONC-8BWFA, CRYONC-8BWA, CRYONC-8BWNA, CRYONC-8NA** **1" (DN 25):** **CRYONC-16FA, CRYONC-16BWFA, CRYONC-16BWA, CRYONC-16BWNA, CRYONC-16NA**

This Certificate is valid until **2021-08-21**.

Issued at **Høvik** on **2017-02-01**
DNV GL local station: **Pusan** for **DNV GL**

Approval Engineer: **Sinisa Sedlan**

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.

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Product description

Manually operated Cryogenic Needle Valves.

Notations:
A: Class 150 (SCH 40)
N: NPT
F: Flanged ends
BW: Butt-welded ends
BWN: Butt-welded to NPT
BWF: Butt-welded to flanged ends

Sizes:
1/2" (DN 15) : CRYONC-8FA, CRYONC-8BWFA, CRYONC-8BWA, CRYONC-8BWNA, CRYONC-8NA
1" (DN 25) : CRYONC-16FA, CRYONC-16BWFA, CRYONC-16BWA, CRYONC-16BWNA, CRYONC-16NA

Materials:

Body:	ASTM A351 CF 8M (N, F, BWN), ASTM A351 CF3M and ASTM A182 F316 (BW, BWF)
Extension bonnet:	ASTM A479 TP316
Flange bonnet:	ASTM A351CF8M
Extension stem:	ASTM A479 TP316
Disc:	ASTM A479 TP316
Bonnet packing:	Graphite Filled/ S316L
Stem packing:	Graphite
Position indicator:	SS316
Handle:	ASTM A351 CF8M
Bolt:	ASTM A320 B8M

Application/Limitation

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

Service	:	Liquefied Gas - Cryogenic Service
Temperature range	:	-196 °C to +38 °C
Max. working pressure	:	10 bar
Sizes and types	:	As given in Product Description

The valve shall not be used as shut off or quick closing valve.

Types with slip-on threaded ends (N and BWN) shall not be used in piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.

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.

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])

Certification

All valves covered by this type approval certificate shall be delivered with a product certificate.

The material used in bodies of vlaves shall be delivered with VL certificate when the minimum design temperature is less than -55°C; otherwise work certificates are accepted. In any case, material of bodies shall be made at foundries approved by the Society.

Marking of product

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

- Manufacturers name or trade mark
- Type designation
- Pressure rating

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.