

# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAP00000TW**  
Revision No:  
**1**

## This is to certify:

**That the Flexible hoses of metallic material with permanently fitted couplings**

with type designation(s)  
**MFH**

Issued to  
**DK-Lok Corporation**  
**Gimhae-si, Gyeongsangnam-do, Korea, Republic of**

is found to comply with  
**DNV rules for classification – Ships Pt.4 Ch.6 Piping systems**  
**DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021**  
**DNV class programme DNV-CP-0184 – Type approval – Flexible hoses with permanently fitted couplings**

## Application :

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

**Temperature range:** -40°C to +450°C  
**Max. working press.:** 151 - 172 - 248 bar (dependent on size and maximum temperature)  
**Sizes:** 1/4" - 3/8" - 1/2"

Issued at **Høvik** on **2022-01-24**

for **DNV**

This Certificate is valid until **2026-12-30**.

DNV local station: **Busan, FiS Korea**

Approval Engineer: **Andreas Hansen**

**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



## Product description

Corrugated stainless steel hose with one layer of stainless steel wire braid reinforcement. Permanently fitted couplings with front and back ferrules.

### Materials:

Hose, braid and coupling body: Stainless steel 316L  
 Front- and back ferrule and nut: Stainless steel 316

## Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled, and delivered by the holder (named as manufacturer) of this certificate.

Hose assemblies covered by this certificate may be used in systems for: Lubricating oil, fresh water, steam, and compressed air. (They are not approved to be used in seawater systems.)

Nominal hose size	1/4"	3/8"	1/2"
Maximum working pressure	248 bar	172 bar	151 bar

At elevated temperatures the maximum allowable pressure shall be reduced according to the table given below:

Temperature [°C]	-40 to +20	50	100	150	200	250	300	350	400	450
Factor	1.0	0.87	0.72	0.65	0.59	0.55	0.51	0.48	0.46	0.45

Flexible hoses are only to be used in short lengths where it is necessary due to vibrations or flexible mounting of the machinery. The hose shall not be used to replace fixed piping and must only be fitted on places where they are always accessible for inspection.

Means shall be provided to isolate flexible hoses used in systems for fuel oil, lubricating oil and compressed air.

The hoses must only be fitted on places where they are always accessible for inspection.

Minimum bending radius is to be ensured according to the manufacturer's instructions/specifications.

Welding shall fulfil requirements in DNV-RU-SHIP Pt.2 Ch.4.

The outermost end of the coupling performing the connection to the fixed piping is not covered by this certificate and shall fulfil the restrictions in DNV-RU-SHIP Pt.4 Ch.6 Sec.9 [5] and DNV-RU-SHIP Pt.6 Ch.2 Sec.5 [11.2] as below:

- Flanged ends shall be according to a recognized standard.
- Threaded joints having pipe threads where pressure-tight joints are made on the threads:
  - 1) with parallel or tapered threads, shall comply with requirements of a recognized national or international standard.
  - 2) shall not be used for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.
- Other mechanical joints are not covered by this certificate and shall be type approved separately in accordance with DNV-CP-0185.

Hose assemblies covered by this certificate shall not be used in systems subject to pressure below atmospheric or systems where pressure pulsation may occur.

## Production testing

All hose assemblies delivered under the DNV type approval scheme shall be subject to a pressure test at 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to this type approval certificate.

## Type Approval documentation

DK Tech Corporation test reports: DKQ-080807-001 (bend test), DKQ-080807-002 (burst pressure test) , DKQ-080806-001 (leakage test), DKQ-080807-003 (fatigue test), witnessed by DNV.

Drawings: MFH468-ASSY-SA dated 2008-06-10, MFH MARKING SPEC. dated 2008-05-27

Burst test report no. TAJD-161201-003 dated 2016-12-01 witnessed by DNV GL surveyor

Burst test report no. TAJD-2111-003, dated 2021-11-24, witnessed by DNV surveyor

## Tests carried out

Burst test - Pliability (bending) test – Fatigue test

## Marking of product

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

- hose manufacturer's name or trademark;
- date of manufacture (month/year);
- designation type reference;
- nominal diameter;
- pressure rating;
- temperature rating.

## 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.