

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Flexible Hoses of Metallic Material with permanently fitted couplings

with type designation(s)
HMF-501, HMF-502

Issued to

HAN KOOK FLEXIBLE CO.
Busan, Republic of Korea

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

DNV GL class programme DNVGL-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: Max. 300°C

Max. working press.: 6/ 16/ 30 bar depending on type and size

Sizes: DN 15 to DN 250mm

Issued at **Høvik** on **2018-08-30**

This Certificate is valid until **2021-12-31**.

for **DNV GL**

DNV GL local station: **Busan**

Approval Engineer: **Adel Samiei**

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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

Corrugated stainless steel hoses, stainless steel single or double braided with loose or welded end flanges.

HMF-501 Corrugated tube with one wirebraid with loose flanges,
HMF-502 Corrugated tube with two wirebraids with welded on end flanges.

Part	Material
Flexible hose	Stainless steel: STS316L, STS304, STS321
Wire braid	Stainless steel: STS304
Lap Joint	Carbon steel: SS400 Carbon steel: STPG370 Stainless steel: STS304
Flange	Carbon steel: SS400 Carbon Steel forging: SF 440 A Stainless steel: STS304

Application/Limitation

The hoses may be used in Fresh water, Cooling water, Compressed air, Fuel Oil (Just HMF502) and Lubricant Oil (Just HMF502)

Dimensions, wall thickness and maximum working pressure:

DN	HMF501 6 bar	HMF501 16 bar	HMF501 30 bar	HMF502 6 bar
15 mm	0.4mm	-	-	0.4mm
20 mm	0.4mm	-	0.5mm	0.4mm
25 mm	0.4mm	0.4mm	0.5mm	0.4mm
32 mm	0.4mm	0.5mm	0.5mm	0.4mm
40 mm	0.4mm	0.5mm	0.6mm	0.4mm
50 mm	0.4mm	0.5mm	0.6mm	0.4mm
65 mm	0.4mm	0.5mm	-	0.4mm
80 mm	0.4mm	-	-	0.4mm
100 mm	0.4mm	-	-	0.4mm
125 mm	0.5mm	-	-	-
150 mm	0.5mm	-	-	-
200 mm	0.6mm	-	-	-
250 mm	0.6mm	-	-	-

In elevated temperature, maximum working pressure is to be reduced according to reduction factors (According to ISO 10380 Table A.4):

Temperature	20°C	50°C	100°C	150°C	200°C	250°C	300°C
304	1,00	0,88	0,73	0,66	0,60	0,56	0,52
316L	1,00	0,88	0,74	0,67	0,62	0,58	0,54
321	1,00	0,92	0,83	0,78	0,74	0,71	0,67

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.

Each hose assembly shall be hydrostatically tested at a hydrostatic pressure of 1.5 times the maximum working pressure and shall be delivered with the pressure test report with reference to the type approval certificate. (No product certificate is required.)

The hoses are to be mounted in accordance with the manufacturer's instructions.

Flexible hoses are only to be used where it is necessary due to vibrations or flexible mounting of the machinery. The hoses shall not replace/be used where permanent piping is possible/required.

Job Id: **262.1-006917-6**
Certificate No: **TAP00000W4**

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

It must be possible to shut off from the system all flexible hoses used in lubricating oil and compressed air systems.

Type Approval documentation

Tests carried out

Hydro test, Braid Yield test, Burst test, Fatigue Bend test, Static Bend test

Marking of product

For traceability to this type approval, the hose assemblies are to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Size

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform a survey - every second year and before the expiry date of this certificate - to verify that the conditions for the type approval are complied with and to witness a burst test on every 3rd sizes.