

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)

1SN, 2SN, R17, 2SC, R12, 4SP, 4SH

Issued to

Koman Hydraulic Co., Ltd.**Changwon-si, Gyeongsangnam-do, Republic of Korea**

is found to comply with

DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems****DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses****Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.**

Type:	Temperature range:	Max. working press.:	Sizes:
1SN	-40°C to +100°C	40 to 225 bar	1/4" to 2"
2SN	-40°C to +100°C	80 to 400 bar	1/4" to 2"
R17	-40°C to +100°C	210 bar	1/4" to 1"
2SC	-40°C to +100°C	165 to 400 bar	1/4" to 1"
R12	-40°C to +121°C	175 to 280 bar	3/8" to 2"
4SP	-40°C to +100°C	280 to 445 bar	3/8" to 1"
4SH	-40°C to +100°C	250 to 420 bar	3/4" to 2"

*** see page 2**Issued at **Høvik** on **2020-03-02**This Certificate is valid until **2025-03-01**.for **DNV GL**DNV GL local station: **Gimhae Station**Approval Engineer: **Adel Samiei**

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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.



Product description

7 types of flexible hose assemblies.

- 1SN:** Designed in accordance with EN 853 with 1 layer of steel wire braid
Fittings: One piece hose fitting – 200 series non-skive type
- 2SN:** Designed in accordance with EN 853 with 2 layers of steel wire braid
Fittings: One piece hose fitting – 200 series non-skive type
- R17:** Design in accordance with SAE J517 with 1 layer of steel wire braid for sizes up to 1/2", 2 layers of steel wire braid for sizes 5/8" to 1"
Fittings: One piece hose fitting – 200 series non-skive type
- 2SC:** Designed in accordance with EN 857 with 2 layers of steel wire braid
Fittings: One piece hose fitting – 200 series non-skive type
- R12:** Designed in accordance with SAE J517 with four plies of spirally wound high tensile steel wire
Fittings: One piece hose fitting – 400 series non-skive type
- 4SP:** Designed in accordance with EN 856 with Four plies of spirally wound high tensile steel wire
Fittings: One piece hose fitting – 400SH series non-skive type
- 4SH:** Designed in accordance with EN 856 with four plies of spirally wound high tensile steel wire
Fittings: One piece hose fitting – 400SH series non-skive type

Material: Tube: Synthetic rubber (S1604, S1904, CHR85, SFT4853)
Cover: Oil, weather and abrasion resistant synthetic rubber (S1907, CHR75, SFT4803, SFT4873)
Fittings: JIS G 4051 S20C

Hose Manufacturer: Koman Hydraulic Co. Ltd/ Haman-gun plant, Gyeongsangnam-do, Republic of Korea

Coupling manufacturer: Koman Hydraulic Co. Ltd/ Changwon-si, Gyeongsangnam-do, Republic of Korea

Assembling location: Koman Hydraulic Co. Ltd/ Haman-gun plant, Gyeongsangnam-do, Republic of Korea

Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by the assembling location stated in product description.

All hose assemblies (except R12) covered by this certificate may be used in systems conveying:

- hydraulic fluids in accordance with ISO 6743-4 (except HFD R, HFD S, HFD T): -40°C to 100°C
- water based hydraulic fluids and air -40°C to +70°C
- water: 0°C to +70°C

Hose R12:

- petroleum based hydraulic fluid: -40 °C to +121°C
- water based hydraulic fluids and air -40°C to +70°C
- fresh water 0°C to +70°C

Working pressure:

Size		1SN	2SN	R17	2SC	R12	4SP	4SH
Dash	Inch							
-4	¼	225 bar	400 bar	210 bar	400 bar	-	-	-
-5	5/16	215 bar	350 bar	210 bar	350 bar	-	-	-
-6	3/8	180 bar	330 bar	210 bar	330 bar	280 bar	445 bar	-
-8	½	160 bar	275 bar	210 bar	275 bar	280 bar	425 bar	-
-10	5/8	130 bar	250 bar	210 bar	250 bar	280 bar	350 bar	-
-12	¾	105 bar	215 bar	210 bar	215 bar	280 bar	350 bar	420 bar
-16	1	88 bar	165 bar	210 bar	265 var	280 bar	280 bar	380 bar
-20	1 ¼	63 bar	125 bar	-	-	210 bar	-	345 bar
-24	1 ½	50 bar	90 bar	-	-	175 bar	-	290 bar
-32		40 bar	80 bar	-	-	175 bar	-	250 bar

Flexible hoses are only to be used in short lengths 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.

The hose assemblies must only be fitted in places where they are always accessible. Flexible hoses of these types are not to be used on boiler fronts.

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

The cover of hoses for gaseous applications shall be pin-pricked.

The outer end of the pipe coupling (performing the connection to the fixed piping) is not covered by this certificate and shall follow the below requirements:

- Flanged ends shall be according to a recognized standard
- Slip-on threaded joints having pipe threads where pressure-tight joints are made on the threads with parallel or tapered threads, shall comply with requirements of a recognized standard. Limitations stated in DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9 [5.2.6] to be followed.
- If these outer ends are going to be part of a mechanical joint as covered by Table 10 DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9, then they shall be separately type approved.

Type Approval documentation

Tests carried out

Dimensional check, change-in-length, burst, oil resistance, ozone resistance, cold flexibility, cover adhesion, fire test, impulse test, vacuum test

Production testing

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.

Marking of product

For traceability to this Type Approval, the products are 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 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.