

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings

with type designation(s)

ADVANSTAR DIB-1SN, ADVANSTAR DIB-2SN, ADVANSTAR DIB-1SC, ADVANSTAR DIB-2SC, ADVANSTAR DHD-4SP, ADVANSTAR DHD-4SH, ADVANSTAR DHD-R15, ADVANSTAR EXS-4SP, ADVANSTAR EXS-4SH

Issued to

SUMITOMO RIKO Hosetex, Ltd.

Ayabe, Kyoto, Japan

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-0183 – Type approval – Flexible non-metallic hoses

Application :

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

Type:	Temperature range:	Max. working press.:	Sizes:
ADVANSTAR DIB-1SN	-40°C to +100°C (see page 4)	see page 3	DN 6, 8, 10, 12, 16, 19, 25, 31, 38, 51
ADVANSTAR DIB-2SN	-40°C to +100°C (see page 4)	see page 3	DN 6, 8, 10, 12, 16, 19, 25, 31, 38, 51
ADVANSTAR DIB-1SC	-40°C to +100°C (see page 4)	see page 3	DN 6, 8, 10, 12
ADVANSTAR DIB-2SC	-40°C to +100°C (see page 4)	see page 3	DN 6, 8, 10, 12
ADVANSTAR DHD-4SP	-40°C to +100°C (see page 4)	see page 4	DN 10, 12, 16, 19, 25
ADVANSTAR DHD-4SH	-40°C to +100°C (see page 4)	see page 4	DN 19, 25, 31, 38, 51
ADVANSTAR DHD-R15	-40°C to +120°C (see page 4)	420 bar	DN 10, 12, 19, 25, 31, 38, 51
ADVANSTAR EXS-4SP	-40°C to +100°C (see page 4)	see page 3	DN 12, 16, 19, 25
ADVANSTAR EXS-4SH	-40°C to +100°C (see page 4)	see page 3	DN 25, 31

Issued at **Høvik** on **2022-11-02**

This Certificate is valid until **2027-11-01**.

DNV local station: **Kobe**

for **DNV**

Approval Engineer: **Maheshraja Venkatesan**

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Sinisa Sedlan
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

9 different types of non-metallic hose assemblies with permanently fitted couplings:-

1. ADVANSTAR DIB-1SN

Hose assemblies constructed according to EN 853 1SN comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 1 layer of high tensile steel wire braid ;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

2. ADVANSTAR DIB-2SN

Hose assemblies constructed according to EN 853 2SN comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 2 layers of high tensile steel wire braid ;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

3. ADVANSTAR DIB-1SC

Hose assemblies designed & constructed according to EN 857 1SC comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 1 layer of high tensile steel wire braid ;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

4. ADVANSTAR DIB-2SC

Hose assemblies designed & constructed according to EN 857 2SC comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 2 layers of high tensile steel wire braid ;
- Cover : oil, abrasion and weather resistant synthetic rubber.
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

5. ADVANSTAR DHD-4SP

Hose assemblies designed & constructed according to EN 856 4SP comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 4 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

6. ADVANSTAR DHD-4SH

Hose assemblies constructed according to EN 856 4SH comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 4 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

7. ADVANSTAR DHD-R15

Hose assemblies constructed according to SAEJ517 type 100R15 comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 4 ($\leq$ DN25) or 6 ($>$ DN25) layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

8. ADVANSTAR EXS-4SP

Hose assemblies constructed according to EN 856 4SP comprising of

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 4 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

9. ADVANSTAR EXS-4SH

Hose assemblies constructed according to EN 856 4SH comprising of sizes DN25 and DN31 withstanding 500000 and 200000 impulse cycles respectively with the following design:

- Tube : oil resistant synthetic rubber (NBR);
- Reinforcement : 4 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
- Cover : oil and weather resistant synthetic rubber (CR);
- Couplings designation : DKOL Series as per submitted catalogue doc.no. SRK-HT DOC007 Rev.1

Material of construction for End fittings: Carbon steel JIS G3101 SS400

Manufacturing locations:

- Hoses : • SUMITOMO RIKO Hosetex, Ltd., Ayabe, Kyoto, Japan
- End fittings : • SUMITOMO RIKO Hosetex, Ltd., Ayabe, Kyoto, Japan
• Zhejiang Stronger Hydraulic Co., Ltd.,
Damaiyu Economical Development Zone, Yuhuan, Zhejiang, China

Assembling location:SUMITOMO RIKO Hosetex, Ltd., Ayabe, Kyoto, Japan

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.

Nominal size, ID			DIB					
			1SN			2SN		
SAE	Inch	DN	MWP (bar)	MBR (mm)	Ferrule	MWP (bar)	MBR (mm)	Ferrule
-4	¼"	06	225	60	S03310-04RW(SZ)	400	80	S03310-04RW(SZ)
-5	5/16"	08	215	65	S03310-05RW(SZ)	350	90	S03310-05RW(SZ)
-6	3/8"	10	180	70	S03310-06RW(SZ)	330	100	S03310-06RW(SZ)
-8	½"	12	160	80	S03310-08RW(SZ)	275	100	S03310-08RW(SZ)
-10	5/8"	16	130	110	S03310-10RW(SZ)	250	120	S03310-10RW(SZ)
-12	¾"	19	105	130	S03310-12RW(SZ)	215	140	S03310-12RW(SZ)
-16	1"	25	88	170	S03310-16RW(SZ)	165	180	S03310-16RW(SZ)
-20	1 ¼"	31	63	210	S03310-20RW(SZ)	125	220	S03310-20RW(SZ)
-24	1 ½"	38	50	240	S03310-24RW(SZ)	90	260	S03310-24RW(SZ)
-32	2"	51	40	310	S03310-32RW(SZ)	80	320	S03310-32RW(SZ)

Nominal size, ID			DIB					
			1SC			2SC		
SAE	Inch	DN	MWP (bar)	MBR (mm)	Ferrule	MWP (bar)	MBR (mm)	Ferrule
-4	¼"	06	225	50	S03310-04RW(SZ)	400	45	S03310-04RW(SZ)
-5	5/16"	08	215	55	S03310-05RW(SZ)	350	55	S03310-05RW(SZ)
-6	3/8"	10	180	60	S03310-06RW(SZ)	330	65	S03310-06RW(SZ)
-8	½"	12	160	70	S03310-08RW(SZ)	275	80	S03310-08RW(SZ)

Nominal size, ID			EXS					
			4SP			4SH		
SAE	Inch	DN	MWP (bar)	MBR (mm)	Ferrule	MWP (bar)	MBR (mm)	Ferrule
-8	½"	12	420	135	S00400-08	-	-	-
-10	5/8"	16	380	160	S00400-10AQ	-	-	-
-12	¾"	19	380	200	S00400-12d25	-	-	-
-16	1"	25	325	230	S00400-16d32	380	240	S00400-16d32
-20	1 ¼"	31	-	-	-	350	250	S00401-20

Nominal size, ID			DHD					
			4SP			4SH		
SAE	Inch	DN	MWP (bar)	MBR (mm)	Ferrule	MWP (bar)	MBR (mm)	Ferrule
-4	¼"	06	-	-	-	-	-	-
-5	5/16"	08	-	-	-	-	-	-
-6	3/8"	10	445	130	S00410-06RW	-	-	-
-8	½"	12	415	140	S00410-08RW (SZ)	-	-	-
-10	5/8"	16	380	160	S00410-10RW (SZ)	-	-	-
-12	¾"	19	380	200	S00410-12RW	420	230	S00410-12RW
-16	1"	25	325	230	S00410-16RW	380	240	S00410-16RW
-20	1 ¼"	31	-	-		325	250	S00410-20RW (AQ)
-24	1 ½"	38	-	-		290	310	S00410-24RW (AQ)
-32	2"	51	-	-		250	450	S00410-32RW (AQ)

Nominal size, ID			DHD R15		
SAE	Inch	DN	MWP (bar)	MBR (mm)	Ferrule
-4	¼"	06	-	-	-
-5	5/16"	08	-	-	-
-6	3/8"	10	420	130	S00400-06
-8	½"	12	420	140	S00400-08
-10	5/8"	16	-	-	-
-12	¾"	19	420	230	S00410-12RW
-16	1"	25	420	240	S00410-16RW
-20	1 ¼"	31	420	320	HDGS-6020
-24	1 ½"	38	420	380	NXS-6024
-32	2"	51	420	480	HDGS-6032

Fluid medium	Temperature range	
	Type R15	Types 1SN, 2SN, 1SC, 2SC, 4SP & 4SH
Hydraulic fluids as per ISO 6743-4 with exception of HFD R, HFD S & HFD T	-40°C to +120°C	-40°C to +100°C
Water based fluids	-	-40°C to +70°C
Air & water	-	0°C to +70°C

All hose assemblies delivered under this type approval certificate shall be in compliance with an assembly procedure issued by the certificate holder.

Flexible hoses shall be limited to a length necessary to provide for relative movement between fixed and flexibly mounted items of machinery/equipment or systems.

Flexible hoses shall be accessible for inspection. Means shall be provided to isolate flexible hoses used in systems for fuel oil, lubricating oil, sea-water cooling and compressed air.

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

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

Hose assemblies of types 4SP, 4SH and R15 covered by this certificate shall not be used in system subject to pressure below atmospheric or vacuum condition.

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 DNV-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 DNV-RU-SHIP Pt.4 Ch.6 Sec.9, then they shall be separately type approved.

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

Tests carried out

Dimensional check, Change in length, Burst pressure, Impulse, Fluid resistance, Ozone resistance, Vacuum, Cold flexibility, Fire and Cover adhesion tests

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 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.