DNV·GL

Certificate No:
TAP00001NX

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)
1SN (EN853), 2SN (EN853), 1SC (EN857), 2SC (EN857), 2SC High Pressure, 2SCPLUS, R17 (SAE J517)

Issued to
CATERPILLAR FLUID SYSTEMS SRL
Cernusco sul Naviglio, MI, Italy

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-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 (EN853)	-40°C to +100°C	63 to 250 bar	DN5 to DN31
2SN (EN853)	-40°C to +100°C	80 to 415 bar	DN5 to DN51
1SC (EN857)	-40°C to +100°C	88 to 225 bar	DN6 to DN25
2SC (EN857)	-40°C to +100°C	160 to 400 bar	DN6 to DN25
2SC High Pressure	-40°C to +100°C	200 to 450 bar	DN6 to DN25
2SCPLUS	-40°C to +120°C	210 to 450 bar	DN6 to DN25
R17 (SAE J517)	-40°C to +100°C	210 bar	DN6 to DN25

Issued at **Høvik** on **2019-04-03**
This Certificate is valid until **2023-12-31**.
DNV GL local station: **Milan**

Approval Engineer: **Adel Samiei**

for **DNV GL**

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

7 types of flexible hose assemblies; made of oil resistant NBR rubber tube, reinforced with 1 or 2 layers of steel wire braids and with weather and oil resistant cover.

Couplings: One-piece fitting type Anchor series 1
Coupling Material: 11SMnPb30, 11SMnPb37

Hose and coupling manufacturer: Caterpillar Fluid Systems srl, Via delle Industrie 30/32 - 03100 Frosinone (FR) - ITALY

Application/Limitation

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by: Caterpillar Fluid Systems srl, Via delle Industrie 30/32 - 03100 Frosinone (FR) – ITALY.

Hose assemblies covered by this certificate may be used in systems conveying:

- petroleum based hydraulic fluid at temperature range stated in the front page
- water based Hydraulic fluids and air -40°C to +70°C
- fresh water 0°C to +70°C

Size			Max working pressure (bar)						
DN	dash	inch	1SN	2SN	1SC	2SC	2SC High Pressure	2SCPLUS	R17
5	-3	3/16	250	415	-	-	-	-	-
6	-4	¼	225	400	225	400	450	450	210
8	-5	5/16	215	350	215	350	420	420	210
10	-6	3/8	180	330	180	330	370	380	210
12	-8	½	160	275	160	275	330	330	210
16	-10	5/8	130	250	130	250	280	300	210
19	-12	¾	105	215	105	215	260	280	210
25	-16	1	88	165	88	165	200	210	210
31	-20	1 ¼	63	125	-	-	-	-	-
38	-24	1 ½	-	90	-	-	-	-	-
51	-32	2	-	80	-	-	-	-	-

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) are 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.

Production testing

All hose assemblies delivered under the DNV GL 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 Test, Change in Length Test, Burst Test, Cold Flexibility Test, Ozone Resistance Test, Impulse Test, fluid resistance Test and Fire Test.

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.