

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, 2ST and 2SC

Issued to

Volz Gruppe GmbH
Deilingen, Germanyis found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses**Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Temperature range:** -40°C up to +125°C
Max. working press.: 415 bar. Refer to certificate.
Sizes: DN5-DN50 (3/16"-2")Issued at **Hamburg** on **2018-02-06**for **DNV GL**This Certificate is valid until **2022-08-09**.DNV GL local station: **Augsburg**Approval Engineer: **Andrii Pishchanskyi**.....
Olaf Drews
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.



Job Id: **262.1-010931-5**
 Certificate No: **TAP000011D**
 Revision No: **3**

Product description

Hose type	Hose standard	Ferrule type	Hose end fittings	Material
1SN	Inner tube: Oil resistant synthetic rubber (Nitrile) Cover: Abrasion-, ozone- and weather resistant synthetic rubber Reinforcement: One wire braid reinforced flexible rubber hoses with permanently attached hose end fittings, per EN853.	PF3	DKO ; DKO 45° ; DKO 90° ; DKLL / DKL / DKS; DKLL / DKL / DKS 45° ; DKLL / DKL / DKS 90° ; BE ; BE 45° ; BE 90° ; BE SW ; BE SW 45° ; BE SW 90° ; DKR ; DKR 45° ; DKR 90° ; DKRF ; DKRF 45° ; DKRF 90° ; AGJ ; DKJ ; DKJ 45° ; DKJ 90° ; CE ; AGR ; AGR WD ; AGR BSPT-m ; AGN ; DSN ; SFL3 / SFS6 ; SFL3 / SFS6 45° ; SFL3 / SFS6 90° ; RGN ; DKO KÄ ; DKNPSM ; GADV ; ORFS-m ; ORFS-f ; ORFS-f 45° ; ORFS-f 90° ; TW ; SAE-f ; SAE 45°-f ; SAE 90°-f ; STL ; STL 45° ; STL 90°	1.4571 (316Ti)
2SN/2ST	Inner tube: Oil resistant synthetic rubber (Nitrile) Cover: Abrasion-, ozone- and weather resistant synthetic rubber Reinforcement: Two wire braid reinforced flexible rubber hoses with permanently attached hose end fittings, per EN853.	2SN: 3/16"-1": PF3 1.1/4"-2": PF11 2ST: PF2	Hose end fittings type see hose type 1SN	1.4571 (316Ti)
2SC	Inner tube: Oil resistant synthetic rubber (Nitrile) Cover: Abrasion-, ozone- and weather resistant synthetic rubber Reinforcement: Two wire braid reinforced flexible rubber hoses with permanently attached hose end fittings, per EN857.	PF3		1.4571 (316Ti)

Production places

Hose end fittings and hose assemblies

Volz Gruppe GmbH Deilingen Germany
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Hoses

Manuli Hydraulics (Suzhou) Co., Ltd.

Application/Limitation

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Maximum allowable working pressure (M.A.W.P)

Inner Ø inch	Inner Ø mm	Working pressure bar			
		1SN	2SN	2ST	2SC
3/16	5	250	415	415	-
1/4	6	225*	400*	400*	400*
5/16	8	215	350	350	350
3/8	10	180	350	350	330
½	12	160*	350*	350*	275*
5/8	16	130	250	250	250
¾	19	105	215	215	245
1	25	90*	175*	175*	210*
1 ¼	31	65	140	140	-
1 ½	38	50*	100*	100*	-
2	51	40	90	90	-

The *marked hoses are tested as representative for the range.

Temperature range

- 40°C to + 125°C
up + 75°C for air
up + 85°C for water

Piping systems

- Fuel oil, lubricating oil and hydraulic oil systems
- Bilge systems
- Fresh and seawater cooling systems
- Compressed air systems**

**Pin prick cover is required for air or gas applications above 17 [bar].

Manufacturer's recommendation shall be observed for a specific application (combination of medium and temperature).

Installation

Hose assemblies shall be fitted in places where they are always accessible.

They should be in as short length as practicable, but should not, in general exceed 1.5m in length.

Hose assemblies shall only be used where necessary to accommodate relative movement between fixed piping and machinery parts (Ref. to MSC.1/Circ.1321). Exceptions are subject to case by case approval.

For installation, the manufacturer's instructions are to be observed.

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

When used in systems conveying flammable fluids flexible hoses shall be shielded from hot surfaces and other sources of ignition.

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

Hose assemblies with hose end fittings made of carbon steel are not to be used at temperatures below -10°C unless the material is normalized.

The use of hose assemblies is not permitted in permanently pressurized starting air lines of diesel engines.

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Hose assemblies covered by this certificate shall not be installed in systems with pressure below atmospheric (vacuum condition).

Flexible hoses of these types are not to be used in boiler fronts.

Responsibility

The company VOLZ, Deilingen takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Production testing

Each manufactured hose assembly is to be subjected to a hydraulic pressure test in accordance to the purchaser specifications, at least in accordance with the DNV GL Rules applicable for the order.

Rules	Test pressure
DNV DNV GL	1.5 x M.A.W.P.
GL	2.0 x M.A.W.P

Remark

For determination of the M.A.W.P. of the hose assembly both, the maximum operating pressure of the hose end fitting pipe connection part and of the hose type, as specified in the VOLZ catalogue, is be considered.

Example

The M.A.W.P. specified for the hose type is 210bar, for the hose end fitting pipe connection part it is 160bar. Accordingly, the M.A.W.P. for the hose assembly is 160 bar.

Type Approval documentation

Impulse testing report for 1SN: No 05/080-1-2,05/076-1,05/081-1,05/082-2
Impulse testing report for 2SN: No 05/080-2-4, 05/076-2, 05/081-2, 05/082-1
Impulse testing report for 2ST: No 05/080-3-1,05/076-3-1,05/081 -3, 05/082-3
Impulse testing report for 2SC: No 05/080-4,05/076-4-1,05/081-4
Burst testing report 1SN: No. 05/080-1-1,05/076-1 -1, 05/081 -1-1,05/082-2-2
Burst testing report 2SN: No. 05/080-2-5, 05/076-2-1,05/081 -2-1,05/082-1 -1
Burst testing report 2ST: No. 05/080-3-2,05/076-3-2, 05/081-3-1, 05/082-3-1
Burst testing report 2SC: No. 05/080-4-1,05/076-4-3, 05/081-4-1
Fire testing report 1SN: No. 1352,-3,-4,-5.0iS0110/05
Fire testing report 2SN: No. 1356,-7,-8,-9.0iS0110/05
Fire testing report 1SN; No.1360,-1,-2,-3.0iS0110/05
Fire testing report 1SN: No. 1364,-5,-6.0iS0110/05
Retention survey report dated 2011-05-18

Tests carried out

Proof pressure test, Change in length test, Burst test, Pressure pulsation test, Fire test acc. ISO 15540 / 15541, Dimensional Check test, Cold Flexibility test, Oil Resistance test, Cover Adhesion test, Ozone resistance test.

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Marking of product

For traceability to this type approval the products are to be marked at least with:

On the hoses	On the hose end fittings
- Manufacturer's name/trade mark: "Manuli"	- Manufacturer logo
- Type designation	- Heat code
- Dash size	- Date / Serial number
- M.A.W.P.	- M.A.W.P.

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical Assessment to be performed after two and a half year (2.5 years, certificate retention) and prior to renewal after five (5 years, certificate renewal).

The objective of the periodical assessment is to verify that the design and production conditions for the hose assemblies covered by this type approval have not been altered.

In addition, a surveyor shall witness the following tests on every 3rd size:

- Dimensional check¹
- Change in length¹
- Leakage test
- Burst test

The tests shall be performed in accordance with procedures given in DNV GL CP 0183 "Type Approval of Flexible Hoses of Non-Metallic Material".

The tests are to be performed with the type of hose end fittings fitted that are type approved with the hoses.

Note

¹ Manufacturer test reports in connection with quality control of production may be accepted.

END OF CERTIFICATE