

TYPE APPROVAL CERTIFICATE

Certificate No:
TAP00000SB
Revision No:
2

This is to certify:

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

with type designation(s)

PH-253 1SN EN853 /SAE 100 R1AT MSHA, PH-254 2SN EN853 /SAE 100 R2AT MSHA, PH-257 1SC EN857 MSHA, PH-258 2SC EN857 / SAE 100 R16 MSHA, PH-293 SAE 100 R17 MSHA, PH-296 WB1C HP MSHA, PH-297 WB2C HP MSHA

Issued to

Polyhose India (Rubber) Pvt Ltd
Kanchipuram, Tamil Nadu, India

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:
PH-253 1SN EN853 /SAE 100 R1AT MSHA	see page 3	40 to 225 bar (see page 3)	DN6, 8, 10, 12, 16, 19, 25, 31, 38 & 51
PH-254 2SN EN853 /SAE 100 R2AT MSHA	see page 3	80 to 400 bar (see page 3)	DN6, 8, 10, 12, 16, 19, 25, 31, 38 & 51
PH-257 1SC EN857 MSHA	see page 3	88 to 225 bar (see page 4)	DN6, 8, 10, 12, 16, 19 & 25
PH-258 2SC EN857 / SAE 100 R16 MSHA	see page 3	165 to 400 bar (see page 4)	DN6, 8, 10, 12, 16, 19 & 25
PH-293 SAE 100 R17 MSHA	see page 3	210 bar	DN6, 8, 10, 12, 16, 19, & 25
PH-296 WB1C HP MSHA	see page 3	100 to 290 bar (see page 4)	DN6, 8, 10, 12, 16, 19, 25 & 31
PH-297 WB2C HP MSHA	see page 3	175 to 450 bar (see page 4)	DN6, 8, 10, 12, 16, 19, 25 & 31

Issued at **Høvik** on **2022-11-01**

for **DNV**

This Certificate is valid until **2027-02-02**.

DNV local station: **India**

Approval Engineer: **Md Rafiqur Rashid**

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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

Hose types:

1. POLYHOSE Type Designation: PH-253 1SN EN853 /SAE 100 R1AT MSHA
 EXITFLEX Type Designation: EF-253 EN853 1SN / SAE 100 R1AT MSHA
 FLUIDCOR Type Designation: FC-253 EN853 1SN / SAE 100 R1AT MSHA
 ANCHOR Type Designation: 1SN EN 853 / SAE 100 R1 AT

Design: Flexible rubber hoses reinforced by brass coated one steel wire braid.

Inner Tube: Oil and water resistant synthetic nitrile based rubber blend.

Reinforcement: One layer of high tensile steel wire braid.

Cover: Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.

Couplings: One-piece Fluidcor series 1 & one-piece Anchor series 1 made of carbon steel - C20 / C35 / C45 (IS 1570-2), EN3B (BS 970-1), or stainless steel 304 / 316 (ASTM A479).

2. POLYHOSE Type Designation: PH-254 2SN EN853 /SAE 100 R2AT MSHA
 EXITFLEX Type Designation: EF-254 EN853 2SN / SAE 100 R2AT MSHA
 FLUIDCOR Type Designation: FC-254 EN853 2SN / SAE 100 R2AT MSHA
 ANCHOR Type Designation: 2SN EN 853 / SAE 100R2 AT

Design: Flexible rubber hoses reinforced by brass coated two steel wire braid.

Inner Tube: Oil and water resistant synthetic nitrile based rubber blend.

Reinforcement: Two layers of high tensile steel wire braid.

Cover: Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.

Couplings: One-piece Fluidcor series 1 & one-piece Anchor series 1 made of carbon steel - C20 / C35 / C45 (IS 1570-2), EN3B (BS 970-1), or stainless steel 304 / 316 (ASTM A479).

3. POLYHOSE Type Designation: PH-257 1SC EN857 MSHA
 EXITFLEX Type Designation: EF-257 EN857 1SC MSHA
 FLUIDCOR Type Designation: FC-257 EN857 / 1SC MSHA
 ANCHOR Type Designation: 1SC EN 857

Design: Flexible rubber hoses reinforced by brass coated one steel wire braid.

Inner Tube: Oil and water resistant synthetic nitrile based rubber blend.

Reinforcement: One layer of high tensile steel wire braid.

Cover: Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.

Couplings: One-piece Fluidcor series 1 & one-piece Anchor series 1 made of carbon steel - C20 / C35 / C45 (IS 1570-2), EN3B (BS 970-1), or stainless steel 304 / 316 (ASTM A479).

4. POLYHOSE Type Designation: PH-258 2SC EN857 / SAE 100 R16 MSHA
 EXITFLEX Type Designation: EF-258 EN857 2SC/ SAE 100 R16 MSHA
 FLUIDCOR Type Designation: FC-258 EN857 2SC/ SAE 100 R16 MSHA
 ANCHOR Type Designation: 2SC EN 857 / SAE 100 R16

Design: Flexible rubber hoses reinforced by brass coated two steel wire braid.

Inner Tube: Oil and water resistant synthetic nitrile based rubber blend.

Reinforcement: Two layers of high tensile steel wire braid.

Cover: Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.

Couplings: One-piece Fluidcor series 1 & one-piece Anchor series 1 made of carbon steel - C20 / C35 / C45 (IS 1570-2), EN3B (BS 970-1), or stainless steel 304 / 316 (ASTM A479).

5. POLYHOSE Type Designation: PH-293 SAE 100 R17 MSHA
 EXITFLEX Type Designation: EF-293 SAE100 R17 MSHA
 FLUIDCOR Type Designation: FC-293 SAE 100 R17 MSHA
 ANCHOR Type Designation: SAE 100 R17 MSHA

Design : Flexible rubber hoses reinforced by brass coated one or two steel wire braid.

Inner Tube: Oil and water resistant synthetic nitrile based rubber blend.

Reinforcement: One or two layers of high tensile steel wire braid.

Cover: Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.

Couplings: One-piece Fluidcor series 1 & one-piece Anchor series 1 made of carbon steel - C20 / C35 / C45 (IS 1570-2), EN3B (BS 970-1), or stainless steel 304 / 316 (ASTM A479).

6. POLYHOSE Type Designation: PH-296 WB1C HP MSHA
 EXITFLEX Type Designation: EF-296 WB1C HP MSHA
 FLUIDCOR Type Designation: FC-296 WB1C HP MSHA

Design: Flexible rubber hoses reinforced by brass coated one steel wire braid.

Inner Tube: Oil and water resistant synthetic nitrile based rubber blend.

Reinforcement: One layer of high tensile steel wire braid.

Cover: Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant

Couplings: One-piece Fluidcor series 1 & one-piece Anchor series 1 made of carbon steel - C20 / C35 / C45 (IS 1570-2), EN3B (BS 970-1), or stainless steel 304 / 316 (ASTM A479).

7. POLYHOSE Type Designation: PH-297 WB2C HP MSHA
 EXITFLEX Type Designation: EF-297 WB2C HP MSHA
 FLUIDCOR Type Designation: FC-297 WB2C HP MSHA

Design: Flexible rubber hoses reinforced by brass coated two steel wire braid.

Inner Tube: Oil and water resistant synthetic nitrile based rubber blend.

Reinforcement: Two layers of high tensile steel wire braid.

Cover: Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.

Couplings: One-piece Fluidcor series 1 & one-piece Anchor series 1 made of carbon steel - C20 / C35 / C45 (IS 1570-2), EN3B (BS 970-1), or stainless steel 304 / 316 (ASTM A479).

Hose manufacturer & hose assembling location :

- Polyhose India (Rubber) Pvt. Ltd.,
 Plot No. F37-F42, F50-F55, F48-F49, F28-F29, F100-F102, SIPCOT Industrial Park,
 Irrungattukottai Pennalur Post, Sriperumbudur Taluk - 602117,
 Kanchipuram District, Tamil Nadu, India.

Coupling Manufacturers:

- FLUIDCOR:
 - o Fluidcor (Ningbo) Co., Ltd, Jiangbei District, No.566 Jinshan Road, Ningbo 315033, China
 - o Polyhose India Pvt. Ltd., No. 1/160, Kannivakkam Village, No. 25, Chengalpattu Taluk, Kancheepuram, Tamil Nadu - 603202, India
- ANCHOR:
 - o Caterpillar Fluid Systems SRL, Via Gobetti, 2a - Palazzo C, 20063 Cernusco sul Naviglio (Milano), Italy

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.

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

Fluid medium & temperature range:

Hydraulic oil	-40 to +100 °C
Water	0 to +70 °C
Air	up to +70 °C
Water glycol hydraulic fluids (except for type R17)	-40 to +70 °C

Materials and material protection chosen for the specific system shall be suitable for the intended medium and environmental conditions. Valves of austenitic stainless steel shall not be used in direct contact with seawater.

For compressed air or gases above 16 bar the cover should be pin pricked.

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

Dash size	DN	Hose I.D.		PH-253 1SN EN853 /SAE 100 R1AT MSHA		PH-254 2SN EN853 /SAE 100 R2AT MSHA	
		inch	mm	Hose designation	Maximum working pressure (bar)	Hose designation	Maximum working pressure (bar)
-4	6	¼	6.4	PH253-04	225	PH254-04	400
-5	8	5/16	8.0	PH253-05	215	PH254-05	350
-6	10	3/8	9.5	PH253-06	180	PH254-06	330
-8	12	½	12.7	PH253-08	160	PH254-08	275
-10	16	5/8	16.0	PH253-10	130	PH254-10	250
-12	19	¾	19.0	PH253-12	105	PH254-12	215
-16	25	1	25.4	PH253-16	88	PH254-16	165
-20	31	1 ¼	31.8	PH253-20	63	PH254-20	125
-24	38	1 ½	38.1	PH253-24	50	PH254-24	90
-32	51	2	50.9	PH253-32	40	PH254-32	80

Dash size	DN	Hose I.D.		PH-257 1SC EN857 MSHA		PH-258 2SC EN857 / SAE 100 R16 MSHA	
		inch	mm	Hose designation	Maximum working pressure (bar)	Hose designation	Maximum working pressure (bar)
-4	6	¼	6.4	PH257-04	225	PH258-04	400
-5	8	5/16	8.0	PH257-05	215	PH258-05	350
-6	10	3/8	9.5	PH257-06	180	PH258-06	330
-8	12	½	12.7	PH257-08	160	PH258-08	275
-10	16	5/8	16.0	PH257-10	130	PH258-10	250
-12	19	¾	19.0	PH257-12	105	PH258-12	215
-16	25	1	25.4	PH257-16	88	PH258-16	165

Dash size	DN	Hose I.D.		PH-293 SAE 100 R17 MSHA		PH-296 WB1C HP MSHA		PH-297 WB2C HP MSHA	
		inch	mm	Hose designation	Maximum working pressure (bar)	Hose designation	Maximum working pressure (bar)	Hose designation	Maximum working pressure (bar)
-4	6	¼	6.4	PH293-4	210	PH296-04	290	PH297-04	450
-5	8	5/16	8.0	PH293-5	210	PH296-05	250	PH297-05	420
-6	10	3/8	9.5	PH293-6	210	PH296-06	230	PH297-06	385
-8	12	½	12.7	PH293-8	210	PH296-08	200	PH297-08	345
-10	16	5/8	16.0	PH293-10	210	PH296-10	150	PH297-10	290
-12	19	¾	19.0	PH293-12	210	PH296-12	125	PH297-12	280
-16	25	1	25.4	PH293-16	210	PH296-16	110	PH297-16	200
-20	31	1 ¼	31.8	-	-	PH296-20	100	PH297-20	175

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

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

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

Hoses assemblies of type R17 covered by this certificate shall not be installed in systems subject to pressure below atmospheric (vacuum condition).

Type Approval documentation

Polyhose catalogue Rev-3:2014 – Print 2
Polyhose catalogue Hydraulic fittings (page 107 to 119)
Couplings catalogue ref.: CM_2015-11b (Anchor) & 2016-03 (Fluidcor)

Impulse test report nos.: 17 dated 2016-08-26; 16 dated 2016-08-23; 15 dated 2016-08-19; 14 dated 2016-08-13; 13 dated 2016-08-10; 12 dated 2016-08-08; 11 dated 2016-08-04; 14 dated 2016-06-07; 13 dated 2016-06-04; 12 dated 2016-06-01; 11 dated 2016-05-30; 10 dated 2016-05-18; 09 dated 2016-05-14; 08 dated 2016-05-12; 07 dated 2016-05-08; 06 dated 2016-05-04; 05 dated 2016-04-29; 04 dated 2016-03-18; 03 dated 2016-02-16; 02 dated 2016-01-02; 01 dated 2015-12-16

Fire test report nos.: 1033/16, 1034/16, 1035/16, 1036/16, 1037/16, 1038/16, 1039/16, 1040/16, 1041/16, 1042/16, 1043/16, 1044/16, 1045/16, 1046/16, 1047/16, 1048/16, 1490/16, 1491/16, 1492/16, 1493/16, 1494/16, 1495/16, 1496/16, 1497/16, 1498/16, 1499/16, 1500/16, 1501/16, 1502/16, 1503/16, 1504/16, 1505/16, 1506/16, 1507/16, 1508/16, 1509/16, 1510/16, 1511/16, 1512/16, 1513/16, 1514/16, 1515/16

Adhesion test reports dated 2016-10-03

Ozone resistance reports dated 2016-07-23

Burst test certificate nos. 01, 02, 03, 04, 05, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 39, 40, 41 & 42 dated 2016-10-21; 37, 38, 39, 40 & 41 dated 2016-10-27;

General Internal test certificate nos. 01, 02, 03, 04, 05, 06, 07, 08, 09, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 43, 44, 45, 46, 47, 48, 50, 51, 53, 54, 55 & 56 dated 2016-10-21; 10, 20, 42, 49, 52, 57 dated 2016-10-27

Burst test certificate nos. 01, 02, 03, 04, 05, 06, 07, 08, 09, 11, 12, 13, 14, 15, 16, 17, 18, 19, 21, 22 and 23 witnessed by DNV dated 2022.08.24.

Tests carried out

Dimensional check, change in length, cold flexibility, oil resistance, water resistance, cover adhesion, ozone resistance, vacuum, impulse, fire and burst.

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 the type approval certificate.

Marking of product

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

- Manufacturer's name or trademark
- Type designation
- Date of manufacturing
- 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.