

# TYPE APPROVAL CERTIFICATE

**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.**  
**Tamilnadu, India**

is 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**  
**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018**

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

Issued at **Høvik** on **2018-06-28**

for **DNV GL**

This Certificate is valid until **2022-02-02**.

DNV GL local station: **Mumbai**

Approval Engineer: **Iselinn Vindstad**

**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.



Job Id: **262.1-010049-4**  
Certificate No: **TAP00000SB**  
Revision No: **1**

## 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).

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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: R17 SAE 100 R17

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., 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

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

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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

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Austenitic stainless steels (1.4401 and 1.4404) are not to be used in direct contact with seawater.

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.

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.

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

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.

### **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,

### **Tests carried out**

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

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### **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 the type approval certificate.

### **Marking of product**

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

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