

# TYPE APPROVAL CERTIFICATE

**This is to certify:**

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

with type designation(s)

**PH-277 4SP EN856 MSHA, PH-278 4SH EN856 MSHA, PH-177 R12 EN856 / SAE 100 R12 MSHA, PH-178 R13 EN856 / SAE 100 R13 MSHA, PH-279 SAE 100 R15 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 July 2015**

**Application :**

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

Type:	Temperature range:	Max. working press.:	Sizes:
<b>PH-277 4SP EN856 MSHA</b>	See certificate	<b>165 to 445 bar (see certificate)</b>	<b>DN10, 12, 16, 19, 25, 31, 38 &amp; 51</b>
<b>PH-278 4SH EN856 MSHA</b>	See certificate	<b>250 to 420 bar (see certificate)</b>	<b>DN19, 25, 31, 38 &amp; 51</b>
<b>PH-177 R12 EN856 / SAE 100 R12 MSHA</b>	See certificate	<b>175 to 280 bar (see certificate)</b>	<b>DN10, 12, 16, 19, 25, 31, 38 &amp; 51</b>
<b>PH-178 R13 EN856 / SAE 100 R13 MSHA</b>	See certificate	<b>350 bar</b>	<b>DN19, 25, 31, 38 &amp; 51</b>
<b>PH-279 SAE 100 R15 MSHA</b>	See certificate	<b>420 bar</b>	<b>DN19, 25, 31 &amp; 38</b>

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

Issued at **Høvik** on **2017-02-03**

for **DNV GL**

DNV GL local station: **Mumbai CMC**

Approval Engineer: **Maheshraja Venkatesan**

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**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.

## Product description

Hose types:

1. POLYHOSE Type Designation : PH-277 4SP EN856 MSHA  
EXITFLEX Type Designation : EF-277 EN856 4SP MSHA  
FLUIDCOR Type Designation : FC-277 EN856 4SP MSHA  
ANCHOR Type Designation : 4SP EN 856 MSHA  
  
Design : Flexible rubber hoses reinforced by brass coated four steel wire spiral.  
Inner Tube : Oil and water resistant synthetic neoprene based rubber blend.  
Reinforcement : Four layers of high tensile steel wire spiral.  
Cover : Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.  
Couplings : Two-piece Anchor series 2 or one-piece Fluidcor series 3 made of Carbon Steel - C20 / C35 / C45
2. POLYHOSE Type Designation : PH-278 4SH EN856 MSHA  
EXITFLEX Type Designation : EF-278 EN856 4SH MSHA  
FLUIDCOR Type Designation : FC-278 EN856 4SH MSHA  
ANCHOR Type Designation : 4SH EN 856 PLUS MSHA  
  
Design : Flexible rubber hoses reinforced by brass coated four steel wire spiral.  
Inner Tube : Oil and water resistant synthetic neoprene based rubber blend.  
Reinforcement : Four layers of high tensile steel wire spiral.  
Cover : Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.  
Couplings : Two-piece Anchor series 3 or two-piece Fluidcor series 2 made of Carbon Steel - C20 / C35 / C45
3. POLYHOSE Type Designation : PH-177 R12 EN856 / SAE 100 R12 MSHA  
EXITFLEX Type Designation : EF-177 EN856 R12/ SAE 100 R12 MSHA  
FLUIDCOR Type Designation : FC-177 EN856 R12/ SAE 100 R12 MSHA  
ANCHOR Type Designation : R12 EN 856 / SAE 100 R12 MSHA  
  
Design : Flexible rubber hoses reinforced by brass coated four steel wire spiral.  
Inner Tube : Oil and water resistant synthetic neoprene based rubber blend.  
Reinforcement : Four layers of high tensile steel wire spiral.  
Cover : Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.  
Couplings : Two-piece Anchor series 2 or one-piece Fluidcor series 3 made of Carbon Steel - C20 / C35 / C45
4. POLYHOSE Type Designation : PH-178 R13 EN856 / SAE 100 R13 MSHA  
EXITFLEX Type Designation : EF-178 EN856 R13/ SAE 100 R13 MSHA  
FLUIDCOR Type Designation : FC-178 EN856 R13/ SAE 100 R13 MSHA  
ANCHOR Type Designation : R13 EN 856 / SAE 100 R13 MSHA  
  
Design : Flexible rubber hoses reinforced by brass coated four or six steel wire spiral.  
Inner Tube : Oil and water resistant synthetic neoprene based rubber blend.  
Reinforcement : Four or six layers of high tensile steel wire spiral.  
Cover : Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.  
Couplings : Two-piece Anchor series 3 or two-piece Fluidcor series 2 made of Carbon Steel - C20 / C35 / C45
5. POLYHOSE Type Designation : PH-279 SAE100 R15 MSHA

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Certificate No: **TAP00000SC**

EXITFLEX Type Designation : EF-279 SAE100 R15 MSHA  
FLUIDCOR Type Designation : FC-279 SAE100 R15 MSHA  
ANCHOR Type Designation : R15 SAE 100 MSHA

Design : Flexible rubber hoses reinforced by brass coated four or six steel wire spiral.  
Inner Tube : Oil and water resistant synthetic neoprene based rubber blend.  
Reinforcement : Four or six layers of high tensile steel wire spiral.  
Cover : Neoprene Based Rubber Blend, Weather, oil, abrasion and ozone resistant.  
Couplings : Two-piece Anchor series 3 or two-piece Fluidcor series 2 made of Carbon Steel - C20 / C35 / C45

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

### 1. PH-277 4SP EN856 MSHA

Hose designation	Dash size	DN	Hose I.D.		Maximum working pressure (bar)
			inch	mm	
PH277-06	-6	10	3/8	9.5	445
PH277-08	-8	12	1/2	12.7	415
PH277-10	-10	16	5/8	16.0	350
PH277-12	-12	19	3/4	19.0	350
PH277-16	-16	25	1	25.4	280
PH277-20	-20	31	1 1/4	31.8	210
PH277-24	-24	38	1 1/2	38.1	185
PH277-32	-32	51	2	50.8	165

Temperature range:

Water glycol hydraulic fluids : -40 to +70 °C

Hydraulic oil : -40 to +100 °C

Water : 0 to +70 °C

Air : up to +70 °C

### 2. PH-278 4SH EN856 MSHA

Hose designation	Dash size	DN	Hose I.D.		Maximum working pressure (bar)
			inch	mm	
PH278-12	-12	19	3/4	19.0	420
PH278-16	-16	25	1	25.4	380
PH278-20	-20	31	1 1/4	31.8	325
PH278-24	-24	38	1 1/2	38.1	290
PH278-32	-32	51	2	50.8	250

Temperature range:

Water glycol hydraulic fluids : -40 to +70 °C

Hydraulic oil : -40 to +100 °C

Water : 0 to +70 °C

Air : up to +70 °C

3. PH-177 R12 EN856 / SAE 100 R12 MSHA

Hose designation	Dash size	DN	Hose I.D.		Maximum working pressure (bar)
			inch	mm	
PH177-06	-6	10	3/8	9.5	280
PH177-08	-8	12	1/2	12.7	280
PH177-10	-10	16	5/8	16.0	280
PH177-12	-12	19	3/4	19.0	280
PH177-16	-16	25	1	25.4	280
PH177-20	-20	31	1 1/4	31.8	210
PH177-24	-24	38	1 1/2	38.1	175
PH177-32	-32	51	2	50.8	175

Temperature range:

Water glycol hydraulic fluids : -40 to +70 °C  
 Hydraulic oil : -40 to +120 °C  
 Water : 0 to +70 °C  
 Air : up to +70 °C

4. PH-178 R13 EN856 / SAE 100 R13 MSHA

Hose designation	Dash size	DN	Hose I.D.		Maximum working pressure (bar)
			inch	mm	
PH178-12	-12	19	3/4	19.0	350
PH178-16	-16	25	1	25.4	350
PH178-20	-20	31	1 1/4	31.8	350
PH178-24	-24	38	1 1/2	38.1	350
PH178-32	-32	51	2	50.8	350

Temperature range:

Water glycol hydraulic fluids : -40 to +70 °C  
 Hydraulic oil : -40 to +120 °C  
 Water : 0 to +70 °C  
 Air : up to +70 °C

5. PH-279 SAE 100 R15 MSHA

Hose designation	Dash size	DN	Hose I.D.		Maximum working pressure (bar)
			inch	mm	
PH279-12	-12	19	3/4	19.0	420
PH279-16	-16	25	1	25.4	420
PH279-20	-20	31	1 1/4	31.8	420
PH279-24	-24	38	1 1/2	38.1	420

Temperature range:

Water glycol hydraulic fluids : -40 to +70 °C  
 Hydraulic oil : -40 to +120 °C  
 Water : 0 to +70 °C  
 Air : up to +70 °C

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.

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.

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Operating temperatures in excess of +100°C (or maximum working temperature), can materially reduce the life time of the hose.

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.

It must be possible to shut off from the system all flexible hoses used in systems for compressed air, lube oil, fuel oil and petroleum base hydraulic oil.

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

Hoses assemblies 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

Couplings catalogue ref.: CM\_2015-11b (Anchor) & 2016-03 (Fluidcor)

Impulse test report nos.: 18 dated 2016-08-23; 10 dated 2016-06-30; 09 dated 2016-06-21; 08 dated 2016-06-13; 07 dated 2016-06-06; 06 dated 2016-05-30; 05 dated 2016-05-19; 04 dated 2016-05-05; 03 dated 2016-04-26; 02 dated 2016-04-14; 01 dated 2016-01-12; 00 dated 2016-02-05; 00 dated 2016-01-27; 00 dated 2016-01-28; 00 dated 2016-01-27

Fire test reports: 1516.OIS0110/16, 1517.OIS0110/16, 1518.OIS0110/16, 1519.OIS0110/16, 1520.OIS0110/16, 1521.OIS0110/16, 1522.OIS0110/16, 1523.OIS0110/16, 1524.OIS0110/16, 1525.OIS0110/16, 1526.OIS0110/16, 1527.OIS0110/16, 1528.OIS0110/16, 1529.OIS0110/16, 1530.OIS0110/16, 1531.OIS0110/16, 1532.OIS0110/16, 1533.OIS0110/16, 1534.OIS0110/16, 1535.OIS0110/16, 1536.OIS0110/16, 1537.OIS0110/16, 1538.OIS0110/16, 1539.OIS0110/16, 1540.OIS0110/16, 1541.OIS0110/16, 1542.OIS0110/16, 1543.OIS0110/16, 1544.OIS0110/16, 1545.OIS0110/16, Fire Test Certificates with Form No.: PHIRPL/QA/067 Rev. 0 for variants PH277 4SP EN 856 MSHA 3/8" & PH177 R12 EN 856/ SAE 100 R12 MSHA 3/8 witnessed by DNV GL Surveyor dated 2016-11-06

Adhesion test reports dated 2016-10-03

Burst test certificate nos. 22, 23, 24, 25, 26, 27, 29, 34, 35 & 36 dated 2016-10-21; 28, 32 & 33 dated 2016-10-27; 30 & 31 dated 2016-11-39

General Internal test certificate nos. 58, 59, 60, 61, 63, 64, 65, 66, 67, 68, 69, 71, 72, 73, 74, 75, 76, 77, 79, 80, 81, 82, 83, 84, 85 & 86 dated 2016-10-21; 62, 70, 78, dated 2016-10-27; 87 dated 2016-11-29

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### **Tests carried out**

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

### **Marking of product**

For traceability to this Type Approval, the products are at least to be marked with:

- Manufacturer's name or trade mark
- Type designation
- Maximum working pressure
- Size
- Additional marking at manufacturer's option

### **Periodical assessment**

For retention of the Type Approval, DNV GL Surveyor shall perform a periodical assessment every second year, to verify that the conditions for the type approval are complied with and to witness the following tests on a selection of sizes:

- Dimensional check
- Change in length
- Burst test

The tests shall be performed in accordance with procedures given in DNV GL-CP-0183 or another recognised standard.

The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses.