

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

This Certificate is valid until **2022-02-02**.Issued at **Høvik** on **2017-02-03**DNV GL local station: **Mumbai**for **DNV GL**Approval Engineer: **Maheshraja Venkatesan**

.....

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

Job Id:
Certificate No: **TAP00000SB**

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

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

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

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

Dash	DN	Hose I.D.	PH-253 1SN EN853 /SAE 100 R1AT	PH-254 2SN EN853 /SAE 100 R2AT
------	----	-----------	--------------------------------	--------------------------------

Job Id:
Certificate No: **TAP00000SB**

size				MSHA		MSHA	
		inch	mm	Hose designation	Maximum working pressure (bar)	Hose designation	Maximum working pressure (bar)
-4	6	1/4	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	1/2	12.7	PH253-08	160	PH254-08	275
-10	16	5/8	16.0	PH253-10	130	PH254-10	250
-12	19	3/4	19.0	PH253-12	105	PH254-12	215
-16	25	1	25.4	PH253-16	88	PH254-16	165
-20	31	1 1/4	31.8	PH253-20	63	PH254-20	125
-24	38	1 1/2	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	1/4	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	1/2	12.7	PH257-08	160	PH258-08	275
-10	16	5/8	16.0	PH257-10	130	PH258-10	250
-12	19	3/4	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	1/4	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	1/2	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	3/4	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 1/4	31.8	-	-	PH296-20	100	PH297-20	175

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.

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.

Job Id:
Certificate No: **TAP00000SB**

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 of type R17 covered by this certificate shall not be installed in systems subject to pressure below atmospheric.

Type Approval documentation

Tests carried out

Dimensional check, change in length, cold flexibility, oil resistance, water resistance, cover adhesion, ozone resistance, vacuum, 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. Hoses from all manufacturing plants mentioned in this certificate are to be tested.