

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Non-Metallic Material with Permanently Fitted Couplings**

with type designation(s)

EN853 1SN, EN853 2SN, EN857 1SC, EN857 2SC, EN856 4SP, EN856 4SH, EN856 R13 & SAE100 R15 with PH Couplings

Issued to

**Polimer Kaucuk San.ve Paz. A.S.
ISTANBUL, Turkey**

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems**DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018****DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses****Application :****Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV GL.****Temperature range:** see page 3**Max. working press.:** 40 bar to 450 bar (see page 3)**Sizes:** DN05 to 51 (see page 3)Issued at **Høvik** on **2020-06-05**This Certificate is valid until **2021-06-30**.for **DNV GL**DNV GL local station: **Istanbul**Approval Engineer: **Maheshraja Venkatesan****Zeinab Sharifi
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

8 different types of non-metallic hose assemblies with permanently fitted PH couplings:-

1. EN 853 Type 1SN
Hose assemblies designed & constructed according to EN 853 1SN comprising of
Tube : oil resistant synthetic rubber;
Reinforcement : 1 layer of high tensile steel wire braid ;
Cover : oil, abrasion and weather resistant synthetic rubber;
Couplings designation : Ferrule : P1 / Insert : DKOS (or equivalent insert according to PH catalogue Section 2)
2. EN 853 Type 2SN
Hose assemblies designed & constructed according to EN 853 2SN comprising of
Tube : oil & glycol resistant synthetic rubber;
Reinforcement : 2 layers of high tensile steel wire braid ;
Cover : oil, abrasion and weather resistant synthetic rubber.
Couplings designation : Ferrule : P2 – DN05 & P3 – DN06 to DN 38 / Insert : DKOS (or equivalent insert according to PH catalogue Section 2)
3. EN 857 Type 1SC
Hose assemblies designed & constructed according to EN 857 1SC comprising of
Tube : oil & glycol resistant synthetic rubber;
Reinforcement : 1 layer of high tensile steel wire braid ;
Cover : oil, abrasion and weather resistant synthetic rubber.
Couplings designation : Ferrule : P9 – DN06 to DN12 & P1 – DN16 to DN25 / Insert : DKOS (or equivalent insert according to PH catalogue Section 2)
4. EN 857 Type 2SC
Hose assemblies designed & constructed according to EN 857 2SC comprising of
Tube : oil & glycol resistant synthetic rubber;
Reinforcement : 2 layers of high tensile steel wire braid ;
Cover : oil, abrasion and weather resistant synthetic rubber.
Couplings designation : Ferrule : P1 / Insert : DKOS (or equivalent insert according to PH catalogue Section 2)
5. EN 856 Type 4SP
Hose assemblies designed & constructed according to EN 856 4SP comprising of
Tube : Oil & glycol resistant synthetic rubber;
Reinforcement : 4 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
Cover : oil, abrasion and weather resistant synthetic rubber.
Couplings designation : Ferrule : P3 / Insert : DKOS (or equivalent insert according to PH catalogue Section 2)
6. EN 856 Type 4SH
Hose assemblies constructed according to EN 856 4SH comprising of
Tube : oil & glycol resistant synthetic rubber;
Reinforcement : 4 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
Cover : oil, abrasion and weather resistant synthetic rubber.
Couplings designation : P4-I / Insert : I-SFS6 (or equivalent insert according to PH catalogue Section 3)

Job Id: **262.1-012720-2**
Certificate No: **TAP0000136**

7. EN 856 Type R13

Hose assemblies designed & constructed according to EN 856 R13 comprising of

Tube : oil & glycol fluid resistant synthetic rubber;
Reinforcement : 4 or 6 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
Cover : oil, abrasion and weather resistant synthetic rubber.
Couplings designation : P6-I / Insert : I-SFS6 (or equivalent insert according to PH catalogue Section 3)

8. SAE100R15

Hose assemblies designed & constructed according to SAE 100R15 from SAE J517 comprising of

Tube : oil & glycol fluid resistant synthetic rubber;
Reinforcement : 4 or 6 layers of spiral plies of steel wire wrapped in alternating directions. Each spiral wire ply shall be separated by an insulating layer of synthetic rubber;
Cover : oil, abrasion and weather resistant synthetic rubber.
Couplings designation : P7-I / Insert : I-SFS6 (or equivalent insert according to PH catalogue Section 3)

Material of construction for End fittings:

- Stainless steel AISI 316Ti/ 1.4571

Manufacturing locations

- Hoses : Polimer Kaucuk San.ve Paz. A.S., Istanbul, Turkey
- End fittings : PH Industrie-Hydraulik GmbH & Co. KG,
Wuppermannshof 8,
D-58256 Ennepetal, Germany

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.

Nominal size, ID			Max working pressure [bar]							
SAE	Inch	DN	1SN	2SN	1SC	2SC	4SP	4SH	R13	R15
-3	3/16"	05	250	415	-	-	-	-	-	-
-4	1/4"	06	225	400	225	400	450	-	-	-
-5	5/16"	08	215	350	215	350	-	-	-	-
-6	3/8"	10	180	330	180	330	445	-	-	-
-8	1/2"	12	160	275	160	275	415	-	-	-
-10	5/8"	16	130	250	130	250	350	-	-	-
-12	3/4"	19	105	215	105	215	350	420	345	420
-16	1"	25	88	165	88	165	280	380	345	420
-20	1 1/4"	31	63	125	-	-	210	325	345	420
-24	1 1/2"	38	50	90	-	-	185	290	345	420
-32	2"	51	40	-	-	-	165	250	345	420

Fluid medium	Temperature range	
	Types R12 & R13	Types 1SN, 2SN, 1SC, 2SC, 4SP & 4SH
Hydraulic fluids as per ISO 6743-4 with exception of HFD R, HFD S & HFD T	-40°C to +120°C	-40°C to +100°C
Water based fluids	-40°C to +70°C	-40°C to +70°C
Air & water	0°C to +70°C	0°C to +70°C

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

Flexible hoses shall be limited to a length necessary to provide for relative movement between fixed and flexibly mounted items of machinery/equipment or systems.

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

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

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

Hose assemblies covered by this certificate shall not be used in system subject to pressure below atmospheric or vacuum condition.

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 DNVGL-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 10 DNVGL-RU-SHIP Pt.4 Ch.6 Sec.9, then they shall be separately type approved.

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 this type approval certificate.

Type Approval documentation

Tests carried out

Dimensional check, Change in length, Burst pressure, Impulse, Fluid resistance, Ozone resistance, Cold flexibility, Fire and Cover adhesion tests

Marking of product

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

- Hose manufacturer's name or trademark;
- Date of manufacture (month/year);
- Designation type reference;
- 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.