

TYPE APPROVAL CERTIFICATE

Certificate No:
TAP000009S
Revision No:
1

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

with type designation(s)

HWB313-D, HWB323-D, 4SP391-D, 4SH392-D, HWB2SC325-D, HWB1SC315-D, R13/397-D, PS-R15/398-D, HWB2N-K32S-D, W3-HWB300-D, HWBR16/32B-D and HWBR17/31C-32C-D (Coupling type "Larga")

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
DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Temperature range: -40°C to +121°C (Type dependent see certificate)****Max. working press.: (Size dependent see certificate)****Sizes: 3/16"-2" (Type dependent, see certificate)**This Certificate is valid until **2020-05-30**.Issued at **Høvik** on **2016-10-21**for **DNV GL**DNV GL local station: **Istanbul**Approval Engineer: **Simon Ratcliffe**

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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.

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Product description

Hose type:

<u>HWB313-D</u>	<u>DIN EN853 1SN/ SAE J517 100 R1 AT</u> Inner tube: Oil resistant synthetic rubber Reinforcement: 1 layer of steel wire braid. Cover: Oil, abrasion and weather resistant synthetic rubber
<u>HWB323-D</u>	<u>DIN EN853 2SN/ SAE J517 100 R2 AT</u> Inner tube: Oil resistant synthetic rubber Reinforcement: 2 layers of steel wire braid. Cover: Oil, abrasion and weather resistant synthetic rubber
<u>HWB1SC315-D</u>	<u>DIN EN857 1SC</u> Inner tube: Oil resistant synthetic rubber Reinforcement: 1 layer of steel wire braid. Cover: Oil, abrasion and weather resistant synthetic rubber
<u>HWB2SC325-D</u>	<u>DIN EN857 2SC</u> Inner tube: Oil resistant synthetic rubber Reinforcement: 2 layers of steel wire braid. Cover: Oil, abrasion and weather resistant synthetic rubber
<u>4SH392-D</u>	<u>DIN EN856 4SH, EXCEPT FOR SIZE DN 31 WHICH IS PRESSURE RATED ACCORDING TO MANUFACTURER'S INSTRUCTIONS.</u> Inner tube: Oil and glycol fluid resistant synthetic rubber. Reinforcement: 4 layers of steel wire spirals. Cover: Oil, abrasion and weather resistant synthetic rubber
<u>4SP391-D</u>	<u>DIN EN856 4SP</u> Inner tube: Oil and glycol fluid resistant synthetic rubber. Reinforcement: 4 layers of steel wire spirals. Cover: Oil, abrasion and weather resistant synthetic rubber
<u>R13/397-D</u>	<u>DIN EN856 R13, SAE 100 R13</u> Inner tube: Oil and glycol fluid resistant special synthetic rubber. Reinforcement: 4-6 layers of steel wire spirals Cover: Oil, abrasion and weather resistant wrapped synthetic rubber
<u>PS-R15/398-D</u>	<u>SAE J 517, SAE 100 R15</u> Inner tube: Oils and glycol fluid resistant synthetic rubber Reinforcement: 4-6 layers of steel wire spirals Cover: Oil, abrasion and weather resistant synthetic rubber
<u>HWB2N-K32S -D</u>	<u>2SN-K acc. manufacturer's spec.</u> Inner tube: Mineral, vegetable and hydraulic oil resistant synthetic rubber Reinforcement: 2 layers of steel wire braid Cover: Oil, abrasion and weather resistant synthetic rubber
<u>HWB300-W3-D</u>	<u>WOOD 3W acc. manufacturer's spec.</u> Inner tube: Oil resistant synthetic rubber Reinforcement: 3 layers of steel wire braid Cover: Oil, abrasion and weather resistant synthetic rubber
<u>HWBR16/32B-D</u>	<u>SAE J 517, SAE 100 R16</u> Inner tube: Mineral, vegetable and hydraulic oil resistant special synthetic rubber Reinforcement: 2 layers of high tensile steel wire braid Cover: Oil, abrasion and weather resistant special synthetic rubber
<u>HWBR17/31C-32C-D</u>	<u>SAE J 517, SAE 100 R17</u> Inner tube: Mineral, vegetable and hydraulic oil resistant special synthetic rubber Reinforcement: 1 or 2 layers of high tensile steel wire braid Cover: Oil, abrasion and weather resistant special synthetic rubber

Hose coupling: VOSS FLUID LARGA – I-23875 Osnago (LC), Italy

Material: Carbon steel acc. to EN 10277-3

Design:

- Swaged ferrules: PF 11, PF 12, PF 13, PF 22, PF 23, MPF 3, MPF 4 (see application/limitation)

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- Nipples: see LARGA Catalogue ed. 14

Application/Limitation

Hose assemblies covered by this type approval certificate are approved for use with petroleum base and water base hydraulic fluids within a temperature range as specified below. Operating temperature in excess of maximum working temperature can materially reduce the life of the hose.

Hose type	Minimum Temperature	Maximum Temperature
HWB313-D, HWB323-D, 4SP391-D, 4SH392-D, HWB2SC325-D, HWB1SC315-D, HWBR16/32B-D, HWBR17/31C-32C-D	-40°C	100°C
R13/397-D	-40°C	120°C
PS-R15/398-D, HWB2N-K32S-D, W3-HWB300-D	-40°C	121°C

Max Working Pressure (MAWP) in Bar, depending on nominal inner diameter (ID)

Nom. ID inch	Nom. ID mm	HWB313-D		HWB323-D		HWB1SC315-D	
		MAWP	Ferrule	MAWP	Ferrule	MAWP	Ferrule
3/16"	5	250	PF22	415	PF22	-	-
1/4"	6	225	PF22	400	PF22	225	PF23
5/16"	8	215	PF22	350	PF22	215	PF23
3/8"	10	180	PF22	330	PF22	180	PF23
1/2"	12	160	PF22	275	PF22	160	PF23
5/8"	16	130	PF22	250	PF22	130	PF11
3/4"	20	105	PF22	215	PF22	105	PF11
1"	25	88	PF22	165	PF22	88	PF11
1 1/4"	32	63	PF22	125	PF22	-	-
1 1/2"	40	50	PF22	90	PF22	-	-
2"	50	40	PF22	80	PF22	-	-

Nom. ID inch	Nom. ID mm	HWB2SC325-D		HWB2N-K32S-D		4SP391-D	
		MAWP	Ferrule	MAWP	Ferrule	MAWP	Ferrule
1/4"	6	400	PF22	450	PF22	450	PF12
5/16"	8	350	PF22	420	PF22	-	-
3/8"	10	330	PF22	385	PF22	445	PF12
1/2"	12	275	PF22	345	PF22	415	PF12
5/8"	16	250	PF22	290	PF22	350	PF13
3/4"	20	215	PF22	280	PF22	350	PF13
1"	25	165	PF22	200	PF22	280	PF13
1 1/4"	32	-	-	-	-	210	PF12
1 1/2"	40	-	-	-	-	185	PF12
2"	50	-	-	-	-	165	PF12

Nom. ID inch	Nom. ID mm	R13/397-D		4SH392-D		PS-R15/398-D	
		MAWP	Ferrule	MAWP	Ferrule	MAWP	Ferrule
3/4"	20	345	MPF-3	420	MPF-3	420	MPF-3
1"	25	345	MPF-3	380	MPF-3	420	MPF-3
1 1/4"	32	345	MPF-4	350	MPF-4	420	MPF-3
1 1/2"	40	345	MPF-4	290	MPF-4	420	MPF-3
2"	50	345	MPF-4	250	MPF-4	420	MPF-3

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Nom. ID inch	Nom. ID mm	W3-HWB300-D		HWBR16/32B-D		HWBR17/31C-D		HWBR17/32C-D	
		MAWP	Ferrule	MAWP	Ferrule	MAWP	Ferrule	MAWP	Ferrule
3/16"	5	-	-	-	-	-	-	-	-
1/4"	6	-	-	350	PF12	210	PF23	-	-
5/16"	8	-	-	297	PF12	210	PF23	-	-
3/8"	10	500	PF12	280	PF12	210	PF23	-	-
1/2"	12	470	PF12	245	PF12	210	PF23	210	PF22
5/8"	16	410	PF12	192	PF12	-	-	210	PF22
3/4"	20	375	PF13	157	PF22	-	-	210	PF22
1"	25	327	PF12	140	PF22	-	-	210	PF22
1 1/4"	32	240	PF12	-	-	-	-	-	-

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.

Each hose assembly is before delivery to be hydraulic pressure tested to 1.5 times the maximum working pressure and be delivered with pressure test report with reference to the type approval certificate.

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

It must be possible to shut off from the system all flexible hoses used in systems for lubrication 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.

Type Approval documentation

The approval is based on the following documentation:

- Manufacturer's hose data sheets.
- Technical specifications.
- Quality Certification Test reports for P-13624 dated 2013-02-26.
- DNV witnessed test reports no.: L09-0067 to L09-0089 and L13-0046 to L13-0056 (for additional hose types HWBR16/32B and HWBR17/31C-32C)
- Larga Catalogue ed. 14.
- Manufacturer's impulse test reports dated 2009-08-05, 2009-09-12, 2009-09-18, 2009-08-16, 2009-08-08, 2009-09-07, 2010-04-06.
- Manufacturer's impulse test reports for additional hose types (HWBR16/32B and HWBR17/31C-32C) dated 2013-03-03, 2013-03-06, 2013-03-11, 2013-03-13, 2013-03-14.
- Manufacturer's test reports no.: L09-0893, L09-0894, L09-0895, L09-0905, L09-0906, L09-0949, L10-1074.
- Fire test reports dated 2009-07-29, 2009-08-01, 2009-07-31, 2010-10-13, 2013-03-06.
- Fire test reports dated 2015-09-28
- Fire test reports dated 2015-11-06

Tests carried out

Dimensional check, Change-in-length, burst, cover adhesion, oil resistance, cold flex, ozone resistance, impulse, leakage tests, vacuum test, fire test.

Marking of product

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

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- Manufacturer Name or identification ,
- Hose type - standard,
- Nominal bore
- Date of production

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