

# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAP000009S**  
Revision No:  
**2**

## This is to certify:

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

with type designation(s)

**HWB313, HWB323, 4SP391, 4SH392, HWB2SC325, HWB1SC315, R13/397, PS-R15/398, HWB2N-K32S, W3-HWB300, HWBR16/32B and HWBR17/31C-32C (Coupling type "VOSS Fluid S.r.I")**

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**  
**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.**

**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)

Issued at **Høvik** on **2021-03-12**

for **DNV**

This Certificate is valid until **2025-05-30**.

DNV local station: **Istanbul**

Approval Engineer: **Thomas Wilhelm Juell**

**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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



## Product description

12 different types of non-metallic hose assemblies with permanently fitted VOSS couplings:

<u>HWB313</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</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</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</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</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</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</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</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</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</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</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</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

**Coupling details**

- Material of construction : 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);  
 - Nipples - see VOSS Fluid Catalogue Hose Fittings

**Manufacturing locations**

- Hoses : Polimer Kaucuk San.ve Paz. A.S., Istanbul, Turkey  
 - Couplings : VOSS FLUID S.r.l – I-23875 Osnago (LC), Italy

**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.

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:

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

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

Nom. ID inch	Nom. ID DN	HWB313		HWB323		HWB1SC315	
		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 DN	HWB2SC325		HWB2N-K32S		4SP391	
		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 DN	R13/397		4SH392		PS-R15/398	
		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-3	420	MPF-4
1 1/2"	40	345	MPF-4	290	MPF-3	420	MPF-4
2"	50	345	MPF-4	250	MPF-3	420	MPF-4

Nom. ID inch	Nom. ID DN	W3-HWB300		HWBR16/32B		HWBR17/31C		HWBR17/32C	
		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	PF13	192	PF13	-	-	210	PF22
3/4"	20	375	PF13	157	PF22	-	-	210	PF22
1"	25	327	PF13	140	PF22	-	-	210	PF22
1 1/4"	32	240	PF12	-	-	-	-	-	-

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 hose assemblies must only be fitted in places where they are always accessible. Flexible hoses of these types are not to be used on boiler fronts.

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 type approval scheme shall be subject to a proof 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

- Renewal burst test report witnessed by DNV GL dated 2020-07-21
- 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)
- VOSS Catalogue.
- 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 products are at least to be marked with:

- hose manufacturer's name or trademark;
- date of manufacture (month/year);



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- designation type reference;
- nominal diameter;
- pressure rating;
- temperature rating.

### **Periodical assessment**

For retention of the Type Approval, a DNV 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.