DNV·GL

Certificate No:
TAP00000T1

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)
PASCALART Series PA 07, PA 10, PA 14, PA 17, PA 21, PA 28 & PA 35

Issued to
Bridgestone Corporation
Tokyo, Japan

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 to 100 ºC (see certificate)**
Max. working press.:	**70 to 345 bar (see certificate)**
Sizes:	**DN 4 to 32 (see certificate)**

This Certificate is valid until **2021-06-29**.

Issued at **Høvik** on **2017-02-13**
DNV GL local station: **Yokohama** 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.

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Job Id:
Certificate No: **TAP00000T1**

Product description

Design:
The hoses have Nitrile Butadiene (NBR) inner tube, reinforcement of high-tension wire (JIS G3506 SWRH), and outer cover of Chloroprene Rubber (CR).

Couplings:
Couplings are of the permanent attached type and are made from carbon steel (SS41).

Application/Limitation

Hoses are suitable for use with hydraulic fluids (water based & petroleum based), fuel and lubricating oil at:

- Ambient temperature range : -40 to +70 °C
- Fluid temperature range : -40 to +100 °C

Maximum allowable working pressure for corresponding size and type:

Hose Type	Inner diameter [mm]	Coupling type*	Reinforcement	Max working pressure	
				in Mpa	in bar(g)
PA 07-04	6.3	UZ	One wire braid	7.0	70
PA 07-06	9.5	UB			
PA 07-08	12.7	UZ			
PA 07-10	15.9	UB			
PA 07-12	19.0	UB			
PA 07-16	25.4	UB			
PA 07-20	31.8	UZ	Two wire braids		
PA 07-24	38.1	HW			
PA 07-32	50.8	HW			
PA 10-04	6.3	UZ	One wire braid	10.5	105
PA 10-06	9.5	UB			
PA 10-08	12.7	UZ			
PA 10-10	15.9	UB			
PA 10-12	19.0	UB			
PA 10-16	25.4	UB			
PA 10-20	31.8	UZ	Two wire braids		
PA 10-24	38.1	HW			
PA 10-32	50.8	HW	Four spiral wires		
PA 14-04	6.3	UZ	One wire braid	14.0	140
PA 14-06	9.5	UB			
PA 14-08	12.7	UZ			
PA 14-10	15.9	UB	Two wire braids		
PA 14-12	19.0	UB			
PA 14-16	25.4	UB			
PA 14-20	31.8	UZ			
PA 14-24	38.1	UZ	Four spiral wires		
PA 14-32	50.8	HW			
PA 17-04	6.3	UZ	One wire braid	17.0	170
PA 17-06	9.5	UB			
PA 17-08	12.7	UZ			
PA 17-10	15.9	UB	Two wire braids		
PA 17-12	19.0	UB			
PA 17-16	25.4	UB			
PA 21-04	6.3	UZ	One wire braid	20.5	205
PA 21-06	9.5	UB	Two wire braids		
PA 21-08	12.7	UZ			
PA 21-10	15.9	UB			
PA 21-12	19.0	UB			

PA 21-16	25.4	UB			
PA 21-20	31.8	UZ	Four spiral wires		
PA 21-24	38.1	UZ			
PA 21-32	50.8	HW			
PA 28-04	6.3	UZ	Two wire braids	27.5	275
PA 28-06	9.5	UB			
PA 28-08	12.7	UB	Four spiral wires		
PA 28-10	15.9	UB			
PA 28-12	19.0	UB			
PA 28-16	25.4	UB			
PA 28-20	31.8	UZ			
PA 28-24	38.1	UB	Six spiral wires		
PA 28-32	50.8	KD			
PA 35-04	6.3	UZ	Two wire braids	34.5	345
PA 35-06	9.5	UB			
PA 35-08	12.7	UB	Four spiral wires		
PA 35-10	15.9	UB			
PA 35-12	19.0	UB			
PA 35-16	25.4	UB			
PA 35-20	31.8	UB	Six spiral wires		
PA 35-24	38.1	UB			
PA 35-32	50.8	EX			

* For more information about coupling types, refer to catalogue no. 2016.06.2000S

This certificate is valid for the specific assembly of hose and coupling type as specified, assembled and delivered by the holder (named as manufacturer) & the hose assembling locations as specified in 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.

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 on boiler fronts.

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

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

The hoses shall not be installed in systems subject to pressure below atmospheric.

For use with compressed air or gases above 16 bar, the cover of the hose has to be pin pricked.

Type Approval documentation

Tests carried out

Tests on hoses: dimensional check, change in length, cold flexibility, oil resistance, cover adhesion & ozone resistance
Tests on hose assemblies: Impulse, burst & fire

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 survey every second year, to verify that the conditions for the type approval are complied with and to witness the following tests on every third size on each type:

- Dimensional check test
- Change in length test
- Burst test
- Production test

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