DNV·GL

Certificate No:
TAP00000DT

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)
2651 and 2652, corresponding to SAE 100R5, FLAME RESISTANT HYDRAULIC HOSES IN ACC. WITH ISO 15540

Issued to
Eaton Germany GmbH
Baden-Baden Baden-Württemberg, Germany

is found to comply with
DNV GL rules for classification – Ships
DNV GL rules for classification – Yachts
DNV GL rules for classification – Offshore units

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.

Temperature range:	**-40 °C up to 100 °C**
Max. working press.:	**14 bar up to 210 bar**
Sizes:	**DN 5 up to DN 70**

This Certificate is valid until **2021-08-08**.

Issued at **Hamburg** on **2016-08-08**

for **DNV GL**

DNV GL local station: **Augsburg**

Approval Engineer: **Peter Gierhan**

Olaf Drews
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: **TAP00000DT**

Production Places 2651

Hose manufacturers:

Eaton Germany GmbH Auefeld 1 D-34346 Hann. Münden Germany	POLİMER KAUÇUK SAN. VE PAZ. A.Ş. Çerkezköy Organize Sanayi Bölgesi Karaağaç mah. 6. Sok No:3 Kapaklı / TEKİRDAĞ TURKEY
Eaton Corporation 1830 Highway 201 South Spur Mountain Home, Arkansas 72653 USA	Eaton Corporation 240 Daniel Road Forest City, North Carolina 28043 USA
Eaton Corporation 860 Blankenship Road Newbern, Tennessee 38059 USA	

Coupling manufacturer:

Eaton Germany GmbH Dr. Reckewegstrasse 1 D-76532 Baden-Baden Germany	Eaton Corporation-Aeroquip Group 1225 W. Main Street Van Wert, Ohio 45891-0389 USA

Product description

Synthetic rubber tube, 2 textile inner braids, outer wire braid reinforcement, synthetic rubber cover.

Application/Limitation

Maximum allowable working pressure:

Hose 2651

Hoses 2651; Max Working Pressure (MWP), depending on nominal inner diameter (ID):						
Part no.	Hose I.D.		Hose O.D		Max. Operating Pressure	
	mm	in	mm	in	bar	psi
2651-4	4,8	0.19	13,2	0.52	210,0	3000
2651-5	6,4	0.25	14,7	0.58	210,0	3000
2651-6	7,9	0.31	17,3	0.68	157,0	2250
2651-8	10,4	0.41	19,1	0.75	140,0	2250
2651-10	12,7	0.50	23,4	0.92	122,0	1750
2651-12	16,0	0.63	27,4	1.08	105,0	1500
2651-16	22,4	0.88	31,2	1.23	56,0	800
2651-20	28,4	1.12	38,1	1.50	43,0	625
2651-24	35,1	1.38	44,5	1.75	35,0	500
2651-32	46,0	1.81	56,4	2.22	24,0	200
2651-40	60,1	2.38	73,2	2.88	24,0	200

Production Places 2652

Hose manufacturer:

Eaton Germany GmbH
Auefeld 1
D-34346 Hann. Münden
Germany

Coupling manufacturer:

Eaton Germany GmbH
Dr. Reckewegstrasse 1
D-76532 Baden-Baden
Germany

Product description

Synthetic rubber tube, 2 textile inner braids, outer wire braid reinforcement, synthetic rubber cover.

Application/Limitation

Maximum allowable working pressure:

Hoses 2652; Max Working Pressure (MWP), depending on nominal inner diameter (ID):			
Part no.	Hose I.D.	Hose O.D	Max. Operating Pressure
	mm	mm	bar
2652-40	63,5	78,6	41,0
2652-48	76,2	91,3	31,0

Range of Application

The a.m. hose sizes of 2651 and 2652 are approved for use in:

- Fuel oil, lubricating oil and hydraulic oil systems
- Bilge and seawater systems
- Fresh and seawater cooling systems
- Compressed air systems**

**Pin prick cover is required for air or gas applications above 17 [bar].

The hose assemblies covered by this type approval may be assembled and delivered by other than the certificate holder under the following conditions:

- The assembler is authorised by a written authorization from the certificate holder. The certificate holder shall keep record of all assembler authorisations.
- Hose assemblies are in accordance with an assembly procedure issued by the certificate holder and the assembler has proved their qualifications by burst testing of a selection of hose/coupling combinations.
- Selection of sizes and testing is to be performed in compliance with the DNVGL CP 0183 and the testing is to be witnessed by DNV GL.

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 shall be delivered with manufacturer's pressure test certificate.
Flexible hoses are only to be used 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.
The hoses are not to be used for suction.
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 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.
The use of hose assemblies is not permitted in permanently pressurized starting air lines of diesel engines

Type Approval documentation

Proof pressure test, Change in length test, Burst test, Pressure pulsation test, Fire test, Dimensional Check test, Cold Flexibility test, Oil Resistance test, Cover Adhesion test, Ozone resistance test.
DNV GL-Cert. 94420-79 HH

Tests carried out

DNV GL class programme CP 0183 - Type Approval of flexible hoses non-metallic materials

Marking of product

For traceability to this type approval the products are to be marked with:
- Manufacturers name or trade mark
- Type designation

Periodical assessment

For retention of the Type Approval, a 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 a selection of sizes:

- Dimensional check.
- Change in length
- Leakage test
- Burst test

The tests shall be performed in accordance with procedures given in DNV GL Type Approval Program "Type Approval of Flexible Hoses of Non-Metallic Material" or another recognized standard.
The tests are to be performed with the type of couplings fitted that are Type Approved with the hoses.

END OF CERTIFICATE