

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)

GH781 corresponding to EN 857 / 2SC; GH793 corresponding to EN 853 / 2SN and 2781 corresponding to EN 853 / 2ST; 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 up to 126 °C

Max. working press.: dep. type and size, see cert.

Sizes: 0,25" to 2" (Depending on type, see certificate)

This Certificate is valid until **2021-09-04**.

Issued at **Hamburg** on **2016-09-05**

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.

Product description

GH781:

Design:

Synthetic rubber inner tube, two wire braid reinforcement and synthetic rubber cover.

Couplings:

Global TTC Fittings, Global Nipples with 1SB Socket (04 thru -20).
Permanently fitted Eaton Global SSC type fittings for 2781 hose made of zinc plated carbon steel.

Manufacturing plants:

Couplings:

Eaton Germany GmbH Dr.-Reckeweg-Straße 1 76532 Baden-Baden Germany	Eaton Corporation 1225 W. Main Street Van Wert, Ohio 45891-0389 USA
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Hoses:

Eaton Germany GmbH Auefeld 1 34346 Hann. Münden, Germany	Eaton Corporation 1830 Highway 201 South Spur Mountain Home, Arkansas 72653
Eaton Corporation 860 Blankenship Road Newbern, Tennessee 38059	Eaton Corporation 45 Tuas View Circuit Singapore 63766
POLİMER KAUÇUK SAN. VE PAZ. A.Ş. Çerkezköy Organize Sanayi Bölgesi Karaağaç mah. 6. Sok No:3 Kapaklı / TEKİRDAĞ TURKEY	

Couplings are fitted to the hoses at plant in Van Wert, Ohio. This type approval is valid also for assemblers at Eaton Corporation worldwide. Same procedures, equipment tolerances and quality procedures shall be used, see Application/Limitation

2781 and GH793:

Design:

Hose type 2781:

Synthetic rubber tube, double wire braid reinforcement and synthetic rubber cover, according to SAE 100 R2A.

Couplings:

Global TTC Fittings, Global Nipples with 1SB Socket (04 thru -20)

Hose type GH 793:

Synthetic rubber tube, double wire braid reinforcement and synthetic rubber cover, according to EN853, 2SN with rating according to the manufacturers spec.

Couplings:

Permanently fitted Eaton Global TTC type for Aeroquip GH793 hose made of zinc plated carbon steel. Global Nipples with 1SB Socket (04 thru -20).

Job Id: **262.1-021645-1**
Certificate No: **TAP00000DM**

Manufacturing plants:
Couplings:

Eaton Germany GmbH Dr.-Reckeweg-Straße 1 76532 Baden-Baden Germany	Eaton Corporation 1225 W. Main Street Van Wert, Ohio 45891-0389 USA
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Hoses:

Eaton Germany GmbH Auefeld 1 34346 Hann. Münden, Germany	Eaton Corporation 1830 Highway 201 South Spur Mountain Home, Arkansas 72653
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Couplings are fitted to the hoses at plant in Van Wert, Ohio. This type approval is valid also for assemblers at Eaton Corporation worldwide. Same procedures, equipment tolerances and quality procedures shall be used, see Application/Limitation

Application/Limitation

Range of Application:

The hoses 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].

Max Working Pressure (MWP), depending on nominal inner diameter (ID):							
Part no.	Hose I.D (inch)	Hose type 2781 MWP		Hose type GH781 MWP		Hose type GH793 MWP	
		(bar)	(psi)	(bar)	(psi)	(bar)	(psi)
4	0.25	400	5800	448	6500	448	6500
5	0.31	350	5100	350	5100	350	5100
6	0.36	345	5000	366	5300	400	5800
8	0.50	295	4250	310	4500	345	5000
10	0.62	250	3600	276	4000	276	4000
12	0.75	215	3100	241	3500	241	3500
16	1.00	175	2500	207	3000	207	3000
20	1.25	155	2200	172	2500	172	2500
24	1.50	125	1800	138	2000	138	2000
32	2.00	90	1300	110	1600	110	1600

Operating temperature range:
2781: -40°C to +100°C
GH781 and GH793: -40°C to +126°C

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.

Hose assemblies delivered from the certificate holder shall be delivered with the following documentation:

- Pressure test report with reference to the type approval certificate.

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.

Hose assemblies delivered from an authorized assembler shall in addition to the pressure test report with reference to the type approval certificate be delivered with a copy of the written authorization stamped by DNV GL.

The hoses can be used for ordinary machinery purposes in the systems mentioned on the front page. They are not to be used where fixed piping is possible/required.

Hoses used for continuous operation at temperatures higher than 100°C will have their lifetime reduced. In such cases more frequent inspections and planned exchange should be a part of the maintenance program.

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.

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

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

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-Ref.-No.: 14-100478, 14-100606

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

Job Id: **262.1-021645-1**
Certificate No: **TAP00000DM**

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