

TYPE APPROVAL CERTIFICATE

This is to certify:

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

with type designation(s)

Aeroquip 1SC GH681, Aeroquip 2SC EC881, Aeroquip 4SP GH425, Aeroquip 4SH GH506

Issued to

TECHNO TRADE spol. s r.o.
Hodolany, Olomoucký, Czech Republic

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.6 Piping systems

DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

DNV GL class programme DNVGL-CP-0183 – Type approval – Flexible hoses

Application :

Product(s) approved by this certificate is/are accepted for installation on vessels classed by DNV.

Type:	Temperature range:	Max. working press.:	Sizes:
Aeroquip 1SC GH681	-46°C to +126°C (see page 2)	41 up to 255 bar (see page 3)	DN 6, 8 10, 12, 16, 19, 25, 31, 38
Aeroquip 2SC EC881	-46°C to +126°C (see page 2)	110 up to 450 bar (see page 3)	DN 6, 8 10, 12, 16, 19, 25, 31, 38
Aeroquip 4SP GH425	-40°C to +100°C (see page 2)	320 up to 490 bar (see page 3)	DN 10, 12, 16, 19, 25
Aeroquip 4SH GH506	-40°C to +100°C (see page 2)	250 up to 420 bar (see page 3)	DN 19, 25, 31, 38

Issued at **Høvik** on **2021-07-05**

This Certificate is valid until **2026-07-04**.

for **DNV**

DNV local station: **Prague CMC**

Approval Engineer: **Maheshraja Venkatesan**

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

4 types of flexible rubber hoses with permanently attached couplings with the following constructional features:

1. **Aeroquip 1SC GH681** constructed according to EN 857 1SC:
 Tube : synthetic rubber (Nitrile) tube;
 Reinforcement : One wire braid reinforcement;
 Cover : DURA-TUFF™ synthetic rubber cover
 Couplings : Global 1A TTC-Fittings
2. **Aeroquip 2SC EC881** constructed according to EN 857 2SC:
 Tube : synthetic rubber (Nitrile) tube;
 Reinforcement : Two wire braid reinforcement;
 Cover : DURA-TUFF™ synthetic rubber cover
 Couplings : Global 1A TTC-Fittings
3. **Aeroquip 4SP GH425** constructed according to EN 856 4SP:
 Tube : synthetic rubber (Nitrile) tube;
 Reinforcement : 4-heavy wire spiral reinforcement
 Cover : DURA-TUFF™ synthetic rubber cover
 Couplings : 1T TTC, Skive GC and 4S TTC
4. **Aeroquip 4SH GH506** constructed according to EN 856 4SH:
 Tube : synthetic NBR rubber tube;
 Reinforcement : 4-high tensile spiral wire reinforcement;
 Cover : DURA-TUFF™ synthetic rubber cover
 Couplings : Global 1A 4S TTC-Fittings

Material of construction for couplings: Carbon steel EN 10277 grade 11SMnPb30

Manufacturing locations:

- Hoses : POLİMER KAÜÇÜK SAN. VE PAZ. A.Ş., Çerkezköy Organize Sanayi Bölgesi Karaağaç mah. 6. Sok No:3, Kapaklı / TEKİRDAĞ, TURKEY
- Couplings : (1) Eaton Germany GmbH,
 Dr. Reckewegstrasse 1,
 D-76532 Baden-Baden, Germany
- (2) Eaton Corporation,
 1225 W. Main Street, Van Wert,
 Ohio 45891-0383, USA

Assembling location:

TECHNO TRADE spol. s r.o.,
 Hodolany, Olomoucký, Czech Republic

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 certificate are approved to be used in the following applications:

Fluid medium	Temperature range	
	GH681 and EC881	GH425 and GH506
petroleum based hydraulic fluids	-46°C to +126°C	-40°C to +100°C
water based hydraulic fluids	-46°C to +70°C	-40°C to +70°C
water	0°C to +70°C	0°C to +70°C

Hose assemblies covered by this certificate are not allowed to be used in systems related to DNV GL classed drilling units (applications covered by DNVGL-OS-E101).

Pressure ratings:

Hose I.D.			Aeroquip GH-681		Aeroquip EC881	
			Part Number	Maximum working pressure (bar)	Part Number	Maximum working pressure (bar)
DN	Dash	inch				
6	-4	1/4	GH681-4	255	EC881-4	450
8	-5	5/16	GH681-5	225	EC881-5	400
10	-6	3/8	GH681-6	235	EC881-6	400
12	-8	1/2	GH681-8	221	EC881-8	360
16	-10	5/8	GH681-10	140	EC881-10	350
19	-12	3/4	GH681-12	138	EC881-12	330
25	-16	1	GH681-16	103	EC881-16	280
31	-20	1 1/4	GH681-20	69	EC881-20	172
38	-24	1 1/2	GH681-24	52	EC881-24	138
51	-32	2	GH681-32	41	EC881-32	110

Hose I.D.			Aeroquip GH425		Aeroquip GH506	
			Part Number	Maximum working pressure (bar)	Part Number	Maximum working pressure (bar)
DN	Dash	inch				
10	-6	3/8	GH425-6	490	-	-
12	-8	1/2	GH425-8	420	-	-
16	-10	5/8	GH425-10	420	-	-
19	-12	3/4	GH425-12	380	GH506-12	420
25	-16	1	GH425-16	320	GH506-16	420
31	-20	1 1/4	-	-	GH506-20	350
38	-24	1 1/2	-	-	GH506-24	300
51	-32	2	-	-	GH506-32	250

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.

Hose assemblies covered by this certificate shall not be used in system subject to pressure below atmospheric or vacuum condition.

The cover of hoses for gaseous applications shall be pin pricked.

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 GL type approval scheme shall be hydrostatically tested to a pressure of 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

Tests carried out

As per 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 at least to be marked with:

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