

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Metallic Material with permanently fitted couplings**

with type designation(s)

HP (single braiding), THP (double braiding)

Issued to

BOA Flexible Solutions S.A.S.
Epoux-Bezu, France

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 July 2015****DNV GL class programme DNVGL-CP-0184 – Type approval – Flexible hoses with permanently fitted couplings****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**

Type:	Temperature range:	Max. working press.:	Sizes:
HP (single braiding)	-55°C to 550°C	55 bar to 180 bar	DN6 to DN50
THP (double braiding)	-55°C to 550°C	78 bar to 255 bar	DN6 to DN50

This Certificate is valid until **2020-10-22**.Issued at **Høvik** on **2016-10-24**for **DNV GL**DNV GL local station: **Paris CMC / VMC**Approval Engineer: **Adel Samiei**

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.

Job Id:
Certificate No: **TAP00000M5**

Product description

Two types of flexible stainless steel annularly corrugated hoses (single braided (HP) or double braid (THP))

Materials:

Corrugated hose: stainless steel 1.4404 (AISI 316 L), 1.4541 (AISI 321)
Braid: stainless steel 1.4301 (AISI 304)
Couplings: stainless steel 1.4301 (AISI 304), 1.4306 / 1.4307 (AISI 304L), 1.4541 (AISI 321), 1.4404 (AISI 316L), 2.4856 (Inconel 625)

Application/Limitation

Hose assemblies covered by this certificate may be used in Lube oil, Cargo oil and Fuel oil, Compressed air, Steam and Condensate, Fresh water and Sanitary systems with the following working pressures:

Size	Maximum working pressure (HP type)	Maximum working pressure (THP type)
DN6	180 bar	255 bar
DN10	145 bar	195 bar
DN12	140 bar	185 bar
DN20	85 bar	125 bar
DN25	78 bar	124 bar
DN32	65 bar	115 bar
DN40	61 bar	90 bar
DN50	55 bar	78 bar

Flexible hoses are only to be used in short lengths where it is necessary due to vibrations or flexible mounting of the machinery. The hose shall not be used to replace fixed piping and must only be fitted on places where they are always accessible for inspection.

Hoses made of austenitic stainless steel are not approved to be used in seawater systems.

Means shall be provided to isolate flexible hoses used in systems for fuel oil, lubricating oil and compressed air.

The hoses are to be mounted according to the manufacturer's instructions, and the hoses are to be supplied with end couplings from the manufacturer.

Each hose is to be hydraulically pressure tested to 1, 5 times the maximum working pressure before installation and to be delivered with a test report with reference to this type approval certificate.

In elevated temperature, maximum working pressure is to be reduced according to reduction factors (According to ISO 10380 Table A.4):

Temperature	20°C	50°C	100°C	150°C	200°C	250°C	300°C	350°C	400°C	450°C	500°C	550°C
1.4301	1,00	0,88	0,73	0,66	0,60	0,56	0,52	0,50	0,48	0,47	0,46	0,42
1.4306/1.4307	1,00	0,87	0,72	0,65	0,59	0,55	0,51	0,48	0,46	0,45	0,44	0,43
1.4404	1,00	0,88	0,74	0,67	0,62	0,58	0,54	0,52	0,50	0,48	0,47	0,47
1.4541	1,00	0,92	0,83	0,78	0,74	0,71	0,67	0,64	0,62	0,61	0,60	0,59
2.4856	1,00	0,95	0,88	0,84	0,80	0,78	0,75	0,73	0,70	0,68	0,65	0,64

Type Approval documentation

Manufacturer's specification for HP/THP types
BOA Technical specification CCMAT10001 dated 2013-09-03
BOA Technical specification CCMAT10002 dated 2016-16-06



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Test report number DL16-13 dated 2016-06-14 witnessed by DNVGL surveyor

Tests carried out

Burst test, bend test (pliability), fatigue test

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 periodical assessment every second year, to verify that the conditions for the type approval are complied with and to witness the Burst test on a selection of sizes with the same type of couplings fitted that mentioned in the product description.