



Certificate no.:
TAP000031A

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Flexible hoses of metallic material with permanently fitted couplings**

with type designation(s)
A100, A200

issued to

Aeroflex Industries Limited
Raigad, Maharashtra, India

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021
DNV class programme DNV-CP-0184 – Type approval – Flexible hoses with permanently fitted couplings

Application:

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

Type:	Temperature range:	Max. working press.:	Sizes:
A100	-55°C to +550°C	See page 2.	DN06 to DN50
A200	-55°C to +550°C	See page 2.	DN20 to DN300

Issued at **Høvik** on **2025-08-18**

This Certificate is valid until **2030-08-17**.

for **DNV**

DNV local unit: **India CMC MES**

Approval Engineer: **Tobias Berntsen**

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 USD 300 000.

Product description

Corrugated stainless steel hose assemblies comprising of single or double braided stainless steel wire reinforcement constructed according to ISO 10380 Type 1-10 with permanently fitted couplings made of external threaded joint, 60° cone and nut or stub end and flange.

Material of construction:

Part	Material grade
Hose	ASTM A240: 304/316L/321
Braid	ASTM A478: 304/304L/316L
Neck ring and flange	ASTM A240: 304/316/321
Coupling and nut	ASTM A276: 304/316/321
Stub end	ASTM A403: 304/316/321

Application/Limitation

The hose assemblies are approved for use in the following systems: Thermal oil, fuel oil, lubricating oil, hydraulic oil, steam, fresh water, liquid fuel, steam (class III) and condensate, and compressed air. The approval does not cover use of these hoses in LNG/LPG applications.

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

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.

Maximum working pressure:

Size	A100 Single Braid	A100 Double Braid	A200 Single Braid	A200 Double Braid
DN6	120 bar	192 bar	-	-
DN8	100 bar	160 bar	-	-
DN10	90 bar	144 bar	-	-
DN12	80 bar	128 bar	-	-
DN16	70 bar	112 bar	-	-
DN20	64 bar	102 bar	64 bar	102 bar
DN25	50 bar	80 bar	50 bar	80 bar
DN32	40 bar	64 bar	40 bar	64 bar
DN40	35 bar	56 bar	35 bar	56 bar
DN50	30 bar	48 bar	30 bar	48 bar
DN65	-	-	24 bar	38 bar
DN80	-	-	18 bar	29 bar
DN100	-	-	16 bar	26 bar
DN125	-	-	14 bar	22 bar
DN150	-	-	10 bar	16 bar
DN200	-	-	8 bar	13 bar
DN250	-	-	7.5 bar	12 bar
DN300	-	-	6 bar	9.5 bar

At elevated temperatures the maximum allowable pressure shall be reduced according to ISO 10380:2012 as follows:

Temperature [°C]		20	50	100	150	200	250	300	350	400	450	500	550
Material	304	1.00	0.88	0.73	0.66	0.60	0.56	0.52	0.50	0.48	0.47	0.46	0.42
	304L	1.00	0.87	0.72	0.65	0.59	0.55	0.51	0.48	0.46	0.45	0.44	0.43
	316	1.00	0.90	0.78	0.71	0.66	0.62	0.58	0.56	0.53	0.52	0.51	0.51
	316L	1.00	0.88	0.74	0.67	0.62	0.58	0.54	0.52	0.50	0.48	0.47	0.47
	321	1.00	0.92	0.83	0.78	0.74	0.71	0.67	0.64	0.62	0.61	0.60	0.59

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 on places where they are always accessible for inspection.

The hoses are not to be used in systems where pressure pulsations may occur.

The hoses are to be mounted according to the manufacturer's instructions.

Stainless steel grades 304/304L/321 are not allowed for any sea water applications; 316/ 316L are not allowed in stagnant sea water conditions.

Welding shall fulfill requirements in DNV Rules Pt.2 Ch.4 and/or DNV-OS-C401, whichever is applicable.

End connections shall fulfil the restrictions in DNV Pt.4 Ch.6 Sec.9 [5] as below:

- Threaded joints having pipe threads where pressure-tight joints are made on the threads:
 - 1) with parallel or tapered threads, shall comply with requirements of a recognized national or international standard.
 - 2) Shall not be used for piping systems conveying toxic or flammable media or services where fatigue, severe erosion or crevice corrosion is expected to occur.
- Mechanical joints other than standard bolted flanges are not covered by this certificate and shall be type approved separately in accordance with DNV-CP-0185.

Production testing

Each hose assembly shall be hydrostatically tested at a hydrostatic pressure of 1.5 times the maximum working pressure shall be delivered with the pressure test report with reference to the type approval certificate. (No product certificate is required).

Type Approval documentation

<u>Document no.</u>	<u>Rev.</u>	<u>Title</u>
	00	Hose assembly drawings
-	-	
100006SW-B	-	
100006DW-B	-	
100010SW-B	-	
100010DW-B	-	
100025SW-B	-	
100025DW-B	-	
100050SW-B	-	
100050DW-B	-	
200150SW-B	-	
200300SW-B	-	
200300DW-B	-	
200040SW-B	-	
200040DW-B	-	
200020SW-B	-	
200150DW-B	-	
200020DW-B	-	Type test report, witnessed by DNV dated 2025-04-07
ADF-0007-XXX	R-00	Nipple 60° Cone Seat (BSP)
ADF-0004-XXX	R-00	Nut Swivel (BSP)
ADF-0016-XXX	R-00	Flange ASME B16.5 150# Swivel/ Fixed
ADF-0030-XXX	R-00	Stub end SCH 40 (Standard)
ADF-0032-XXX	R-00	Neck Ring A100 SWB
ADF-0033-XXX	R-00	Neck Ring A100 DWB
ADF-0035-XXX	R-00	Neck Ring A200 SWB
ADF-0036-XXX	R-00	Neck Ring A200 DWB
-	-	Letter from Aeroflex Industries Limited dated 16 th August 2025

Tests carried out

Burst test, Bending Fatigue test, Pliability (bending test) type 1-10.

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

This certificate is only valid if required periodical assessments are carried out with satisfactory results.

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 DNV-CP-0338.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>.

Manufactured by:

Hose and neck ring (ferrule) manufacturer

Aeroflex Industries Ltd., Raigad, Maharashtra - 410 208, India