

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Flexible Hoses of Metallic Material with permanently fitted couplings**with type designation(s)
HJB-FXA, HJB-FXB

Issued to

Hae Jo Industrial Co., Ltd
Gimhae-si, Gyeongsangnam-do, Republic of Korea

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-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 GL.**

Type:	Temperature range:	Max. working press.:	Sizes:
HJB-FXA	-20°C to +250°C	30 bar	15A,20A,25A,32A,40A,50A,65A,80A
HJB-FXA	-20°C to +250°C	10 bar	100A,125A,150A,200A,250A,300A
HJB-FXB	-20°C to +150°C	30 bar	15A,25A,40A,50A,65A,80A

Issued at **Høvik** on **2020-02-18**This Certificate is valid until **2024-06-09**.for **DNV GL**DNV GL local station: **Gimhae Station**Approval Engineer: **Adel Samiei**

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.



Product description

Flexible hoses of metallic material with standard flanges as end connections.

Hoses are annular corrugated hose made of SUS304/304L/316/316L/321 braided with same austenitic stainless steels.

Material of End Pipes are stainless steel SUS304/304L/316/316L/321.

Standard flanges according to EN or JIS standard made of stainless steel SUS304/304L/316/316L/321 or carbon steel SS400, SF400 suitable for the intended pressure rating.

Hose Manufacturer: Hae Jo Industrial Co., Gimhae-Si, Republic of Korea

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.

The flexible hoses covered by this certificate may be used in fresh water cooling system, lubrication oil, fuel oil, steam (class III) and condensate, fresh water and compressed air applications.

At elevated temperatures, maximum allowable pressure is to be reduced according to ISO10380 Table A4, as below:

Temperature (°C)	20	50	100	150	200	250
SUS304 / 1.4301	1	0.88	0.73	0.66	0.60	0.56
SUS304L / 1.4306	1	0.87	0.72	0.65	0.59	0.55
SUS316 / 1.4401	1	0.90	0.78	0.71	0.66	0.62
SUS316L / 1.4404	1	0.88	0.74	0.67	0.62	0.58
SUS321 / 1.4541	1	0.92	0.83	0.78	0.74	0.71

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 sizes 150A and above are not to be used in systems where pressure pulsations may occur.

It must be possible to shut off from the system all hoses used in the fuel oil, lubricating oil and compressed air systems.

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

Welding shall fulfill requirements in DNV GL Rules Pt.2 Ch.4.

Type Approval documentation

Tests carried out

Burst test, Bending Fatigue test, Static Bending test, Impulse test

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



Job Id: **262.1-031159-1**
Certificate No: **TAP000021H**

For retention of the Type Approval, a DNV GL 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.