DNV·GL

Certificate No:
TAP000029A

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plate Heat Exchanger

with type designation(s)
T35-FM/T35-PFM

Issued to
Alfa Laval Lund AB
Lund, Skåne Län, Sweden

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

Application :

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

Temperature range:	**See certificate**
Design pressure:	**See certificate**
Operating media:	**See certificate**

Issued at **Høvik** on **2021-02-02**

This Certificate is valid until **2026-02-01**.

for **DNV GL**

DNV GL local station: **Sweden CMC**

Approval Engineer: **Mohsen Mohebbi**

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 GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.

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Job Id: **262.1-034503-1**
Certificate No: **TAP000029A**

Product description

Plate Heat Exchangers with tightening bolts designed according to DNV GL ship rules Pt.4 Ch.7 (Parts not covered by Pt.4 Ch.7 are designed in accordance with EN13445)

Material of construction:

Frame and Pressure Plate	:	GOST 5520 09G2S alt. 20K; GOST 380 ST3SP; ASME SA-36; ASME SA-516 Gr. 60 alt. Gr. 70; KS D 3503 SS275; JIS G 3101 SS400; JIS G 3103 SB410; GB/T 700 Q235-B, -C or -D; JIS G 3106 SM400-B or -C alt. SM520-B or -C; GB 713 Q245R alt. Q345R; EN 10028-2 P265GH; EN 10025-2 S235JR+M, J0-M alt. J2+M EN 10025-2 S355JR+M, J0+M alt. J2+M EN 10025-2 S235JR+N, J0+N alt. J2+N EN 10025-2 S355JR+N, J0+N alt. J2+N
Tightening Bolt	:	GOST 4543 40X; GB/T 3077 42CrMo; JIS G 4107 SNB7; ASME SA193 Gr.B7; EN 10269 42CrMo4
Stud bolt	:	ISO 898-1 Class 8.8; GB/T 3098.1 Class 8.8; Incl. materials as for Tightening bolt
Tightening bolt nut	:	JIS G 4051 S45C; ISO 898-2 Class 8; GOST 4543 40X; GB/T 3098.2 Class 8; ASME SA-194 Gr. 2H; EN 10269 42CrMo4
Channel plate		Stainless steel, Titanium or Nickel alloys
Gasket		Non asbestos fiber gasket

Corrosion allowance: 0 mm

Manufacturing locations:

Manufacutring site	*Location*
Alfa Laval Lund AB, Sweden	Lund, Skåne Län, Sweden
Alfa Laval Jiangyin, China	465 Renmin Road, Qiaoqi, Xiake Town Jiang Yin City, Jiangsu Province 214408 China
Alfa Laval Shonan, Japan	7-11-2, Ichinomiya, Samukawa-machi, Koza-gun Kanagawa 253-0111 Japan
Alfa Laval Poseung, Korea	Alfa Laval Korea Ltd. 169, Pyeongtaekhang-ro 268beon-gil, Poseung-eup Pyeongtaek-si, Gyeonggi-do Republic of Korea

Application/Limitation

Gasketed plate heat exchanger with tie bolted frame plates of series type T35-FM / T35-PFM approved for the media as specified in the below table according to limitations referred in DNV GL ship rules Pt.4 Ch.7 Sec.1 Table 2 to specify the class of the heat exchanger :

Models	T35-FM / T35-PFM
Design temperature (°C)	Design pressure (MPa)
50	1.10
60	1.00
80	0.90
100	0.80
Minimum design temperature	0°C
Corrosion allowance (mm)	0
Medium	Lube oils, Fuel oils, Hydraulic oils, Sea water, Fresh water, Water/Glycol solutions, Steam

Materials and material protection and gasket chosen for the specific system shall be suitable for the intended medium and environmental conditions. Surface in contact with the medium shall be protected from corrosion by considering adequate corrosion allowance, and/or by applying suitable coatings. Surface preparation and coating shall be approved by the Society.

Heat exchanger plates and gaskets shall withstand and meet the requirements of the operating media and temperature.

Type Approval documentation

Production Testing

Each heat exchanger is to be hydraulic pressure tested to minimum 1.5 x design pressure. The hydrostatic test pressure shall be applied separately to the hot side and to the cold side with atmospheric pressure on the other side.

Certification

Materials for pressure retaining parts are to be delivered with material certificates according to DNVGL-RU-SHIP Pt. 4 Ch. 7 Sec. 1 Tables 5, 6 or 7, and shall meet the requirements of relevant parts of DNVGL-RU-SHIP Pt. 2 Ch. 2.

Each heat exchanger shall be certified by a DNV GL surveyor and to be delivered with a DNV GL product certificate when it is required by DNV GL Rules or by purchaser.

Marking of product

For traceability to this Type Approval, the marking of pressure vessels shall show at least the following particulars:

- manufacturer's name and address
- type designation and serial number
- year of manufacture
- maximum allowable working pressure
- hydrostatic test pressure.

Periodical assessment

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.