

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Plate Heat Exchanger**

with type designation(s)

T10-FG (T10-BFG, T10-BDFG, T10-BDcFG, T10-MFG, T10-MDFG)

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 page 3****Design pressure: See page 3****Operating media: See page 3**Issued at **Høvik** on **2020-08-31**This Certificate is valid until **2025-08-30**.for **DNV GL**DNV GL local station: **Sweden CMC**Approval Engineer: **Thomas Wilhelm Juell**

**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.



Job Id: **262.1-033974-1**
Certificate No: **TAP000025V**

Product description

Plate Heat Exchanger with tightening bolts designed according to DNVGL-RU-SHIP Pt.4 Ch.7 (Parts not covered by Pt.4 Ch.7 are designed in accordance with EN 13445).

Materials:

Frame and Pressure plate	SS275 (KS D 3503) SM400-B or -C (JIS G 3106) SB410 (JIS G 3103) SS400 (JIS G 3101) 20K (GOST 5520) ST3SP (GOST 380) Q235-B, -C or -D (GB/T 700) Q245R (GB 713) SA-516 Gr. 60 or Gr. 70 (ASME) SA-36 (ASME) S235JR+N, J0+N or J2+N (EN 10025-2) S235JR+M, J0+M or J2+M (EN 10025-2) P265GH (EN 10028-2) ¹ S355JR+N, J0+N or J2+N (EN10025-2) ¹ S355JR+M, J0+M or J2+M (EN 10025-2) ¹ 09G2S (GOST 5520) ¹ Q345R (GB713) ¹ SM520-B or -C (JIS G 3106) ¹
Tightening bolt	SNB7 (JIS G 4107) 40X (GOST 4543) 42CrMo (GB/T 3077) 42CrMo4 (EN 10269) SA-193 Gr. B7 (ASME)
Stud bolt	Class 8.8 (ISO 898-1) Class 8.8 (GB/T 3098.1) Incl. material as for tightening bolt
Gasket	Non asbestos fibre gasket
¹ Materials allowed for pressure level High	

Manufacturing locations:

Alfa Laval Lund, Sweden
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 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 of series type T10-FG approved for the media according to limitations referred in DNVGL-RU-SHIP Pt.4 Ch.7 Sec.1 Table 2 to specify the class of the heat exchanger.

Models	T10-FG (T10-BFG, T10-BDFG, T10-BDcFG, T10-MFG, T10-MDFG)	
	Design pressure (MPa)	
Design temperature (°C)	Pressure level High	Pressure level Low
50	1.70	1.70
100	1.65	1.50
150	1.60	1.25
180	1.55	1.20
200	1.50	1.15
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 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 DNVGLRU-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.

Manufacturing facility for heat exchangers of class I and II shall be approved by DNV GL in accordance with DNVGL-CP-0261.

Marking of product

For traceability of this Type Approval, the marking of plate heat exchangers shall show at least the following particulars:

- manufacturer's name and address
- type designation and serial number
- year of manufacture



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- 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.