DNV·GL

Certificate No:
TAP00002A4

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plate Heat Exchanger

with type designation(s)
MK15-FD/MK15-FDR

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
DNV GL rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
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: **-50°C / 200°C (See page 2)**
Design pressure: **33 bar (See page 2)**
Operating media: **See page 2**

Issued at **Høvik** on **2021-01-28**
This Certificate is valid until **2026-01-27**.
DNV GL local station: **Sweden CMC**

for **DNV GL**

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.

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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	:	P265GH according to EN 10028-2 P355NL2 according to EN 10028-3 alt. P275NL2 up to 50°C
Tightening Bolt	:	42CrMo4 according to EN 10269
Stud bolt	:	Class 8.8 according to EN ISO 898-1 A2-70 according to EN ISO 3506 42CrMo4 according to EN 10269
Channel plate	:	Stainless steel, Titanium or Nickel alloys
Gasket	:	Non asbestos fiber gasket

Corrosion allowance: 0 mm

Manufacturing locations:

Manufacturing site	*Location*
Alfa Laval Lund AB, Sweden	Lund, Rudeboksvagen 1, Sweden

Application/Limitation

Gasketed plate heat exchanger with tie bolted frame plates of series type MK15-FD/MK15-FDR approved for the media 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:

Pressure-Temperature rating	
Temperature (°C)	Design pressure (MPa)
-50 to 50	3.30
100	3.20
150	2.90
180	2.70
200	2.60

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 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.

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 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.