



Certificate no.:
TAP00002WW

TYPE APPROVAL CERTIFICATE

This is to certify:

that the **Plate Heat Exchanger**

with type designation(s)
T20-FS

issued to

Alfa Laval Technologies AB
Lund, Skåne Län, Sweden

is found to comply with

DNV rules for classification – Ships Pt.4 Ch.7 Pressure equipment

Application:

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

Temperature range: See page 2

Design pressure: See page 2

Operating media: See page 2

Issued at **Høvik** on **2024-09-25**

This Certificate is valid until **2029-09-24**.

for **DNV**

DNV local unit: **Sweden CMC**

Approval Engineer: **Thomas Wilhelm Juell**

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 300,000 USD.



Form code: TA 251

Revision: 2023-09

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Product description

Plate Heat Exchanger T20-FS with tightening bolts designed according to DNV-RU-SHIP Pt.4 Ch.7 (Parts not covered by Pt.4 Ch.7 are designed in accordance with EN 13445).

Material of construction:

Frame and Pressure Plate and Blind cover/inspection cover	: GB 713 Q345R EN 10028-2 P265GH EN 10028-3 P275NL2* EN 10028-3 P355NL2 ASME SA-516 Gr. 60 or Gr. 70
Tightening Bolt	: EN 10269 42CrMo4 ASME SA-193 Gr. B7 ASME SA-320 Gr. L7
Stud bolt	: ISO 898-1 Class 8.8 ISO 3506 A2or A4-70 GB/T 3098.1 Class 8.8 Incl. materials as for Tightening bolt
Tightening bolt nut	: ISO 898-2 Class 8 GB/T 3077 42CrMo GB/T 3098.2 Class 8 EN 10269 42CrMo4 ASME SA-194 Gr. 2H or Gr.7 or Gr.4L or Gr.7L
Channel plate	: Stainless steels 304, 316, 316L, Titanium Grade 1 according to ASME SB-265 or alloy 254 (UNS 31254)
Gasket	: Non asbestos fibre gasket according EN 13445-3 Annex H Table H.1

*Maximum design temperature applicable is limited to 50°C.

Application/Limitation

Gasketed plate heat exchanger (PHE) with tie bolted frame plates of series type T20-FS approved for the medium according to limitations referred in DNV-RU-SHIP Pt.4 Ch.7 Sec.1 Table 2 to specify the class of the heat exchanger. This type approval certificate does not cover application for liquified gas.

Model	T20-FS
Design temperature (°C)	Design pressure (MPa)
50	3.60
100	3.45
150	3.15
180	3.00
200	2.95
Maximum external pressure	-0.1 MPa
Minimum design temperature	-55°C
Corrosion allowance (mm)	0

Allowable external loads and maximum permissible design pressure according to the connection standards EN 1092-1/ ASME B16.5/JIS B2220 is outlined in Table B in calculation drawing of T20-FS referenced in "Type Approval Documentation" section below.

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.

Stainless steel channel plates grades SUS304, 316 and 316L shall not be used in seawater systems.

Type Approval documentation

Production Testing and Certification

Production Testing and Certification for the actual intended application shall follow the latest applicable edition of the Rules (as mentioned on the front page of this certificate).

Delivery condition and mechanical properties for the materials shall fulfil relevant parts of DNV-RU-SHIP Pt.2 Ch.2 as appropriate to the design conditions and selected material grade(s).

Marking of product

Minimum marking requirements shall be as outlined in the edition of the Rules (as mentioned on the front page of this certificate).

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>.