DNV·GL

Certificate No:
**TAP000019Y**

# TYPE APPROVAL CERTIFICATE

## This is to certify:

**That the Plate Heat Exchanger**

with type designation(s)
**PHE M3-FG**

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**

## Application :

**Products approved by this certificate are accepted for installation on vessels classed by DNV GL.**

| | |
|---|---|
| **Temperature range:** | **-10 °C to 200 °C (see limitations in certificate)** |
| **Design pressure:** | **-1 barg to 20 barg (see limitations in certificate)** |
| **Operating media:** | **See certificate** |

Issued at **Høvik** on **2018-04-17**

This Certificate is valid until **2022-12-31**.

for **DNV GL**

DNV GL local station: **Gothenburg**

Approval Engineer: **Morten Engnestangen**

**Marianne Spæren Marveng**
**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.



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Job Id: **262.1-008783-4**
Certificate No: **TAP000019Y**

## Product description

Plate heat exchanger type M3-FG with tie bolted frame plates

Design code: EN 13445

Corrosion allowance: 0 mm

Permissible pressure-temperature range:

| Operating temperature °C | Max. allowable pressure bar |
|---|---|
| 50 | 20 |
| 100 | 18 |
| 150 | 17 |
| 180 | 16 |
| 200 | 15 |

Material:

- Frame & Pressure Plate: P265GH (EN10028-2)
- Tightening bolts: 42CrMo4 (EN10269) / Class 8.8 (EN ISO 898-1)
- Nuts: 42CrMo4 (EN10269) / Class 8 (EN ISO 898-2)
- Channel plates: Stainless steel / Titanium.
- Channel plate gaskets: Rubber (e.g. NBR, EPDM, FKM)
- Flange gasket: Reinforced flexible graphite with plain stainless steel layer sticked

Dimensions:

| | |
|---|---|
| Thickness of frame and pressure plates: | 19.7 mm |
| Dimension of tie-bolts: | M16 |
| Gasket length: | 1688.1 mm |
| Gasket width: | 6.8 mm |

## Application/Limitation

The plate heat exchangers covered by this certificate are approved for operating fluids according to DNVGL Pt.4 Ch.7 Sec.1 Table 2. The table shall also be considered as the basis for classification.

The gasket materials are to be suitable for the media and operating temperature.

The media are not to have a degenerative or corrosive effect on materials in direct contact with the media.

Traditional types of stainless steels, including types like 304, 304L, 316, 316L, etc., shall not be used in direct contact with seawater. Refer DNVGL Pt.4 Ch.7 Sec.2 [1.1.1].

The type approval is limited to the main pressure envelope. Type approval does not cover evaluation of environmental loads, nozzle loading, supports, ship movements, etc. For applications where such loadings are relevant these are to be subject to separate case by case approval. Refer DNVGL Pt.4 Ch.7 Sec. 4 [2.3].

The frame and pressure plates are to be paitned so they are suitably protected towards corrosion for the environment in which the heat exchanger will be installed. The media are not to be in contact with the painted frame and pressure plates.

Each heat exchanger is to be:

- Hydraulic pressure tested to 1,5x design pressure.
- Certified by DNVGL and delivered with a product certificate when required by DNVGL Rules or by the purchaser.

Materials shall be delivered with material certificates as required by DNVGL Ship rules Pt.4 Ch.7 Sec.1 Table 5 to 7.

## Type Approval documentation

Design Report, ref no. 3490018747, rev.1

## Marking of product

Each product delivered according to this certificate shall be permanently and legibly marked on the vessel or on a nameplate permanently attached to a principal pressure part to show its identity and origin.
The marking shall show the following particulars:

- Manufacturer's type designation and serial number
- Year of manufacture
- Design pressure
- Design temperature

## 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.