Certificate No:
TAP00002F1

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Cooler

with type designation(s)
WFN 090/2M

Issued to
Parker Hannifin Manufacturing S.r.l.
Sant'Angelo di Piove di Sacco, Italy

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment

Application :

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

Temperature range:	**-10 to 200 °C / -10 to 90 °C (Tube side / Shell side)**
Design pressure:	**16 bar / 10 bar (Tube side / Shell side)**
Operating media:	**Air / Water (Tube side / Shell side)**

Issued at **Hamburg** on **2021-11-03**
This Certificate is valid until **2026-11-02**.
DNV local station: **Italy/Malta CMC**

Approval Engineer: **Le Loi Nguyen**

for **DNV**

Jonathan Struwe
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 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.

Product description

Aftercooler Type WFN 090/2M

Application/Limitation

Applied Rule:
DNVGL-RU-SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition July 2020),

Design pressure:	16 bar / 10 bar	(Tube side / Shell side)
Design temperature:	-10 to 200 °C / -10 to 90 °C	(Tube side / Shell side)
DNVGL Pressure Equipment Class:	II / III	(Tube side / Shell side)

Material:

- All used material shall be delivered with material certificates according to DNVGL-RU-SHIP Pt.4 Ch.7 Sec.1 [Table 6 and 7].
- Materials for shell tube plate are to meet Charpy V-notch energy values of minimum 27 J at 5°C below minimum design temperature. The material of the tightening bolts and nuts shall meet the requirements of ISO 898.
- The chosen gasket material shall be suitable for design temperature and intended medium.

Manufacturing, workmanship and testing shall be done according to DNVGL-RU-SHIP Pt.4 Ch.7 Sec.7.
Extent of non-destructive testing shall be in line with DNVGL-RU-SHIP Pt.4 Ch.7 Sec.7 [4.1.2].

Each Aftercooler is to be:

- Hydraulic pressure tested to 1.5 x design pressure,
- Certified by DNV and delivered with a product certificate.

Type Approval documentation
Marking of product

For traceability to this type approval the products are at least to be marked with:

- the name and domicile of the manufacturer,
- the manufacturer's type designation and serial number,
- the year of manufacture,
- the design pressure,
- the design temperature in °C,
- the hydraulic test pressure, and
- DNV's identifying mark

Periodical assessment

The objective of the periodical assessment is to verify that the conditions for the type approval (TA) have not been altered.

The main scope of the periodical assessment will normally include:

- verification of the TA applicant's production and quality system w.r.t. ensuring continued consistent production of the TA products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products
- review of TA documentation and that this is still used as basis for the production
- review of possible changes in the design, the materials and the performance of the product
- verification of the product marking

For retention of the TA certificate in its validity period the periodical assessments will be carried out every two years.

Unscheduled assessments for retention of the certificate may be carried out when there is reason to believe that the type approval applicant has not adhered to the obligations stipulated in the type approval certificate.

End of Certificate