Certificate No:
TAP00002N3

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Evaporator

with type designation(s)
E38 and C38

Issued to
Wieland Provides S.r.l.
Latina, LT, Italy

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNV-OS-D101 – Marine and machinery systems and equipment, Edition July 2021

Application :

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

Temperature range:	**-10°C to 80°C**
Design pressure:	**Shell side 13.7 bar, tube side 10 bar**
Operating media:	**Shell side: refrigerant R134a, R513a, R1234ze or R515b tube side: water**

Issued at **Høvik** on **2023-03-13**

This Certificate is valid until **2028-03-12**.

for **DNV**

DNV local unit: **Italy/Malta CMC**

Approval Engineer: **Jane Lozanov**

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 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

Two types of evaporators E38 and C38 (shell and tube heat exchangers designed according to DNV-RU-SHIP pt.4 Ch.7 and ASME VIII div.1).

Materials:

Shell	SA-516 Gr.70N
Tubesheet	SA-516 Gr.70N
Tubes	SB-359 C12200 or C70600 or C71500
Nozzles	SA-53 type E Grade B or SA-106 Grade B

Manufacturing locations:
- Wieland Provides Srl, Latina, Italy

Application/Limitation

In accordance with DNV Pt.4 Ch.7 Sec.1 [3.1.4] the water end boxes have not been subject to design approval and certification are to be based on visual inspection, review of material certificates and pressure testing witnessed by DNV surveyor.
Heat exchangers covered by this certificate are approved as Class II (shell side) and Class III (tube side).
1 mm corrosion allowance for carbon steel materials are considered.
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.
Materials for pressure equipment to shall meet the requirements given in the relevant chapters and sections for pressure equipment in DNV-RU-SHIP Pt.2 Ch.2.

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).

Marking of product

Each heat exchanger shall be permanently and legibly marked on the pressure part or on a nameplate permanently attached to a principal pressure part to show its identity and origin.
The marking of the heat exchanger 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
- design temperature range.

Periodical assessment

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.