



Certificate no.:
TAP000033D

TYPE APPROVAL CERTIFICATE

This is to certify:
that the Heat Exchanger

with type designation(s)
HEAT EXCHANGER HX200, HEAT EXCHANGER HX300

issued to
INDUSTRIAS TECNICAS DE GALICIA, S.A.
Mos, PONTEVEDRA, Spain

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 all vessels classed by DNV.

Type	Temperature range:	Design pressure:	Operating media:
HEAT EXCHANGER HX200	-49°C - 149°C	Shell side: -1/9 bar Tube side: -1/45 bar	Shell side: water / Tube side: He-N2
HEAT EXCHANGER HX300	-49°C - 149°C	Shell side: -1/9 bar Tube side: -1/45 bar	Shell side: water / Tube side: He-N2

Issued at **Høvik** on **2025-12-18**

This Certificate is valid until **2030-12-17**.

for **DNV**

DNV local unit: **NB/CMC Team West**

Approval Engineer: **Mohsen Mohebbi**

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 USD 300 000.

Product description

Materials:

Shell	SA-312 TP316L ASME
Cone / head shell	1.4401/1.4404/316L EN10028-7
Channel	1.4401/1.4404/316L EN10028-7
Tubesheet	SA-182 F316L ASME
Tubes	SA-213 TP316L ASME
Nozzles	SA-240 TP316L ASME

Application/Limitation

Model	HX200/HX300	
	Shell side	Tube side
Medium	Water	He-N ₂
Design pressure (bar)	-1/9	-1/45
Test pressure (bar)	15.3	68.1
Design temperature (°C)	-49/149	-49/149
Pressure vessel class	III	II
Joint efficiency	0.85	0.85
Corrosion allowance (mm)	0	0

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.

Austenitic stainless steels applications (grade 316 & 316L) shall comply with the guidance in DNV-RU-SHIP Pt.4 Ch.6 Sec.2 Table 1.

Mean metal temperature during operation:

Shell side: 40.4°C

Tube side: 43.2°C

Type Approval documentation

Production testing and Certification

Each heat exchanger shall be subjected to hydrostatic pressure test upon completion to at least 1.5 times the design pressure in the presence of a DNV Surveyor. In case of pneumatic pressure test strict safety precautions shall be taken and safety during testing is the sole responsibility of the manufacturer. The DNV surveyor may at any point refuse to witness a pneumatic pressure test and request a hydraulic pressure test.

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>

Manufactured by:

INDUSTRIAS TECNICAS DE GARCIA, S.A., Mos, Pontevedra, Spain