



Certificate no.:
TAP000031C

TYPE APPROVAL CERTIFICATE

This is to certify:
that the Heat Exchanger

with type designation(s)
1st intercooler, 2nd intercooler

issued to
DASCO Co., Ltd.
Busan, Republic of Korea

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 all vessels classed by DNV.

Type	Temperature range:	Design pressure:	Operating media:
1st intercooler	Shell side: -29°C to 100°C / Tube side: -29°C to 200°C	Shell side 10 bar / Tube side 20 bar	Shell side: cooling water / Tube side: gas
2nd intercooler	Shell side: -29°C to 100°C / Tube side: -29°C to 200°C	Shell side 10 bar / Tube side 35 bar	Shell side: cooling water / Tube side: gas

Issued at **Høvik** on **2025-06-25**

This Certificate is valid until **2030-06-24**.

DNV local unit: **Busan, CMC Korea**

for **DNV**

Approval Engineer: **Jane Lozanov**

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

Two types of heat exchangers designed according to DNV-RU-SHIP Pt.4 Ch.7 and ASME Section VIII dev.1.

Materials:

Shell, channel, reversing, channel head, reversing head, baffle plate	SA240, 304
Tubesheet	SA182, F304
Tubes	SA249, TP304

Application/Limitation

Model	1st		2nd	
	Shell side	Tube side	Shell side	Tube side
Medium	Cooling water	Gas (N ₂ +He)	Cooling water	Gas
Design pressure (bar)	10	20	10	35
Test pressure (bar)	15	30	15	52.5
Design temperature (°C)	100	200	100	200
Pressure vessel class	III	I	III	I
Joint efficiency	0.85	1	0.85	1
Corrosion allowance (mm)	0	0	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 shall not be used in direct contact with seawater.

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.

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

The 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>.