DNV·GL

Certificate No:
TAP00001UD

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Evaporator

with type designation(s)
E27, EV32, EV40, EV50

Issued to
PROVIDES METALMECCANICA SRL
Latina, LT, Italy

is found to comply with
DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment
DNVGL-OS-D101 – Marine and machinery systems and equipment, Edition January 2018

Application :

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

Type:	Temperature range:	Design pressure:	Operating media:
E27, EV32	-10°C to +80°C (both sides)	Shell side 10.5 bar/ Tube side 30 bar	Shell side: Fresh water / Tube side: refrigerant group 1
EV40, EV50	-10°C to +80°C (both sides)	Shell side 10.5 bar/ Tube side 27 bar	Shell side: Fresh water / Tube side: refrigerant group 1

Issued at **Høvik** on **2019-07-12**
This Certificate is valid until **2024-07-11**.
DNV GL local station: **Milan**

Approval Engineer: **Adel Samiei**

for **DNV GL**

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.

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Product description

Four types of evaporators (shell and tube heat exchangers– dual with two circuit units)

Materials:		
	Gas inlet/outlet header & Tubesheet:	SA516 Gr.70N
	Shell & water inlet/outlet pipe:	SA106 Gr.B, SA53 E/B, P235TR2
	Heat exchanger tube:	SB359 C12200
	Bolt:	SA193 B7 or 8.8
	Flange:	SA105

Manufacturing location:

- PROVIDES Metalmeccanica S.r.l, Latina, Italy
- Chengdu Provides Air Conditioning Technology Co., Ltd, Chengdu, Sichuan, China

Application/Limitation

Heat exchangers covered by this certificate are approved as Class II (Tube side) and Class III (shell side). 1 mm corrosion allowance for carbon steel materials are considered.

Material of pressurized parts (with thickness 6 mm or greater) shall be impact tested at -15°C with a impact value of 27J (transverse) / 41J (longitudinal). For pipes in class III DNV GL Ship Rules Pt.2 Ch.2 Sec.5 [2.4.1] shall be considered.

Production testing

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 GL Surveyor.

Certification

Materials for pressure retaining parts are to be delivered with material certificates according to DNVGL-RU-SHIP Pt. 4 Ch. 7 Sec. 1 table 7 for the shell side and Table 6 for the tube side. Also, relevant requirements in DNVGL-RU-SHIP Pt. 2 Ch. 2 shall be fulfilled.

All materials delivered with VL or works (W) certificate shall be made at works approved by DNV GL.

Manufacturers of welded pressure equipment of class II shall be approved by DNV GL
Each heat exchanger shall be certified by a DNV GL surveyor and to be delivered with a DNV GL product certificate.

Type Approval documentation

Calculation report	-	0	2019-03-19	For Information
Datasheet 2222DNV	-	0	2019-03-19	For Information
FEM reports	-	0	2019-05-23/27	For informaiton

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 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.