

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Cooler**

with type designation(s)

QDKR Class 00, QDKR Class 01, QDKR Class 02, QDKR Class 03

Issued to

Modine Söderköping AB
SÖDERKÖPING, Sweden

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 GL.**

Type:	Temperature range:	Design pressure:	Operating media:
QDKR Class 00	0°C to 99°C	6	seawater / freshwater
QDKR Class 01	0°C to 99°C	8	seawater / freshwater
QDKR Class 02	0°C to 99°C	10	seawater / freshwater
QDKR Class 03	-20°C to 99°C	15	seawater / freshwater

Issued at **Høvik** on **2017-11-15**This Certificate is valid until **2019-06-30**.for **DNV GL**DNV GL local station: **Stockholm**Approval Engineer: **Morten Engnestangen**

Marianne Spæren Marveng
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.



Job Id: **262.1-003222-6**
Certificate No: **TAP000015B**

- Air coolers, types QDKR classes 00, 01, 02 & 03
- Certified according to DNVGL ship rules Pt.4 Ch.7 as class III pressure vessels.
- Corrosion allowance:
Carbon steel parts: 1 mm
Stainless steel and coated carbon steel parts: 0 mm

Application/Limitation

- Design conditions of each type are as followings:
- All used material shall be delivered with material certificate according to DNVGL ship rules Pt.4 Ch.7 Sec.1 Table 7.
- In seawater applications, coated carbon steel parts shall be used. Surface preparation and coating shall be done in accordance with coating procedure 9364-707.
- Stainless steels 316L and 1.4404 are not to be used for seawater application. Refer DNVGL Pt.4 Ch.7 Sec.2 [1.1.1] Guidance note.
- All titanium and titanium alloy tubes shall be made at works approved by DNVGL.
- Extent of non-destructive testing (NDT) shall be done according to DNVGL ship rules Pt.4 Ch.7 Sec.7 [4.1.3].
- Manufacturing, workmanship and testing shall be done according to DNVGL ship rules Pt.4 Ch.7 Sec.7
- Each product is to be hydraulic pressure tested to minimum 1.5xdesign pressure and to be delivered with product certificate when required by DNVGL Rules or by the purchaser.

Type Approval documentation

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Marking of product

For traceability to this type approval the products are to be marked permanently and legibly with:

- Manufacturer's name or trade mark
- Type designation
- Design Pressure
- Design Temperature

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment every second year and before the expiry date of this certificate. The scope of the periodical assessment, is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

The main elements of the certificate retention survey are:

- Review of Type Approval documentation
- Review of possible changes in design, materials and performance
- Ensure traceability between manufacturer's product type marking and Type Approval Certificate.

END OF CERTIFICATE