

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Plate Heat Exchanger**

with type designation(s)

GX-051N, GX-085N, GL-085N, GX-026P, GC-026P, GX-051P, GC-016P, GC-052P, GL-013P, GX-042P, GX-091P, GX-060P, GC-060P, GC-052N, GX-100P, GX-145N, GL-145N, GX-140P, GL-218N, GL-152N

Issued to

**Tranter Heat Exchangers (Beijing) Co., Ltd.
Beijing, China**

is found to comply with

DNV GL rules for classification – Ships Pt.4 Ch.7 Pressure equipment**Application :****Plate heat exchanger(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.****Temperature range:** See certificate**Design pressure:** See certificate**Operating media:** Fresh water, sea water, steam, alcohol, brine, lubrication oil, MGO and MDOIssued at **Hamburg** on **2018-12-20**This Certificate is valid until **2023-12-19**.DNV GL local station: **Tianjin**for **DNV GL**Approval Engineer: **Stefan Wiemer**

Harald Pauli
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.



Product description

- 20 types of plate heat exchangers with tie bolted frame plates,
- For details of the plate heat exchangers (e. g. design data, materials or dimensions) see Application / Limitation and Type Approval documentation listed below.

Application/Limitation

- Applied rules and design codes:
 - Approved according to DNV GL rules ship Pt.4 Ch.7 'Pressure Equipment' (Edition January 2018)
 - Designed according to EN 13445-3:2009
- Approved design pressure and design temperature:

Type	Design Pressure	Design Temperature
GX-051N	-1 / +10bar	-10°C / +170°C
GX-085N, GL-085N	-1 / +10bar	-10°C / +170°C
GX-026P, GC-026P	-1 / +16bar	-10°C / +170°C
GX-051P	-1 / +16bar	-10°C / +170°C
GC-016P	-1 / +16bar	-10°C / +170°C
GC-052P	-1 / +16bar	-10°C / +170°C
GL-013P	-1 / +16bar	-10°C / +170°C
GX-042P	-1 / +16bar	-10°C / +170°C
GX-091P	-1 / +16bar	-10°C / +200°C
GX-060P, GC-060P	-1 / +16bar	-10°C / +150°C
GC-052N	-1 / +10bar	-10°C / +170°C
GX-100P	-1 / +16bar	-10°C / +150°C
GX-145N, GL-145N	-1 / +10bar	-10°C / +170°C
GX-140P	-1 / +16bar	-10°C / +150°C
GL-218N	-1 / +9bar	-10°C / +170°C
GL-152N	-1 / +8,5bar	-10°C / +170°C

- DNV GL Pressure Equipment Class (Pt.4 Ch.7 Sec.1 table 2):
 - Class I: liquid fuels/ lubricating oils/ flammable hydraulic fluids > 150°C design temperature,
 - Class II: liquid fuels/ lubricating oils/ flammable hydraulic fluids ≤ 150°C design temperature, steam > 7 bar design pressure,
 - Class III: steam ≤ 7bar design pressure, fresh/sea water, non flammable hydraulic fluids,
- All material used for pressurized parts shall be delivered with material certificates according to Pt.4 Ch.7 Sec.1 Table 5, 6 or 7 (depending on the governing pressure equipment class of the heat exchanger). It shall meet the impact requirements as stated in DNV GL Rules Pt.2 Ch.2 Sec.2,
- In case of pressure equipment class I or II: the material used for the movable or fixed covers or the tightening bolts and nuts shall be delivered by a manufacturer holding a valid certificate according to DNV GL CP-0346 'DNV GL approval of manufacturing scheme',
- It is the manufacturer's responsibility to ensure that the materials for the heat transfer plates and the gaskets are suitable for the intended service conditions and life time, also concerning the applicable media, corrosion resistance and wear,
- Traditional stainless steels, including types 304, 304L, 316 or 316L, are generally not considered suitable in contact with seawater,

- Each plate heat exchanger is to be:
 - Hydraulic pressure tested to minimum 1.5 x design pressure,
 - Certified by DNV GL and to be delivered with a product certificate.

Type Approval documentation

Marking of product

For traceability to this type approval the products are at least to be marked with:

- the name and domicile of the manufacturer,
- the manufacturer's type designation and serial number,
- the year of manufacture,
- the design pressure,
- the design temperature in °C,
- the hydraulic test pressure, and
- DNV GL's identifying mark.

Periodical assessment

The objective of the periodical assessment is to verify that the conditions for the type approval (TA) have not been altered.

The main scope of the periodical assessment will normally include:

- verification of the TA applicant's production and quality system w.r.t. ensuring continued consistent production of the TA products at the TA applicant's own premises and at other companies that are given the responsibility for manufacturing of the products,
- review of TA documentation and that this is still used as basis for the production,
- review of possible changes in the design, the materials and the performance of the product, and
- verification of the product marking.

For retention of the TA certificate in its validity period the periodical assessments will be carried out bi-yearly.

Unscheduled assessments for retention of the certificate may be carried out when there is reason to believe that the type approval applicant has not adhered to the obligations stipulated in the type approval certificate.

End of Certificate