

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

GL-013T, GC-016T, GX-026T, GC-026T, GX-042T, GX-051T, GC-052N, GC-052T, GX-060T, GC-060T, GX-064T, GX-085T, GL-085T, GX-091T, GX-100T, GX-140T, GX-145T, GL-145T, GL-152T, GX-205T, GL-205T, GL-218T, GL-240T, GL-284T

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 Exchangers approved by this certificate are accepted for installation on all vessels classed by DNV GL.****Temperature range:** **-10°C/+170°C****Design pressure:** **-1/+7bar or -1/+10bar, see application/limitation****Operating media:** **Fresh Water, Sea Water, Steam, Alcohol, Brine, Lubrication Oil, MGO, MFO**This Certificate is valid until **2021-09-01**.Issued at **Hamburg** on **2016-09-02**for **DNV GL**DNV GL local station: **Tianjin**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

- 24 types of plate heat exchangers with tie bolted frame plates
- Operating Media: Fresh Water, Sea Water, Steam, Alcohol, Brine, Lubrication Oil, MGO, MFO
- For details of the plate heat exchangers (e. g. design data, materials or dimensions) see Approved Drawings (listed below in "Application/Limitation")

Application/Limitation

- List of approved drawings and design data:

Type	No. Approved Drawing	Design Pressure	Design Temperature
GL-013T	E013-005 Rev. 0	-1/+10bar	-10°C/+170°C
GC-016T	E016-005 Rev. 0	-1/+10bar	-10°C/+170°C
GX-026T, GC-026T	E026-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-042T	E042-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-051T	E051-005 Rev. 0	-1/+7bar	-10°C/+170°C
GC-052T	E052-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-064T	E064-005 Rev. 0	-1/+10bar	-10°C/+170°C
GX-091T	E091-005 Rev. 0	-1/+10bar	-10°C/+170°C
GX-060T, GC-060T	E060-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-100T	E100-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-140T	E140-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-085T, GL-085T	E085-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-145T, GL-145T	E145-005 Rev. 0	-1/+7bar	-10°C/+170°C
GX-205T, GL-205T	E205-005 Rev. 0	-1/+7bar	-10°C/+170°C
GL-152T	E152-005 Rev. 0	-1/+7bar	-10°C/+170°C
GL-218T	E218-005 Rev. 0	-1/+7bar	-10°C/+170°C
GL-284T	E284-005 Rev. 0	-1/+7bar	-10°C/+170°C
GL-240T	E240-005 Rev. 0	-1/+7bar	-10°C/+170°C
GC-052N	E052-002 Rev. 0	-1/+10bar	-10°C/+170°C

- Applied Rules and Design Code:
 - DNV GL SHIP Pt.4 Ch.7 'Pressure Equipment' (Edition October 2015),
 - EN 13445
- 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 when required by DNV GL Rules or by the purchaser
- DNV GL Pressure Equipment Class:
 - 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 used material shall be delivered with material certificates according to DNV GL Rules for Classification – Ships Pt.4 Ch.7 Sec.2 Table 1. The heat transfer plates are graded as tubes in heat exchangers.

- Material for the movable and fixed covers are to meet Charpy V-notch energy values of minimum 27 J at 5°C below minimum design temperature or -20°C whichever is lower.
- The material of the tightening bolts and nuts shall meet the requirements of ISO 898.
- The chosen gasket material shall be suitable for design temperature and intended medium, as well as the materials of the heat transfer plates.
- Traditional stainless steels, including types 304, 304L, 316 or 316L, are generally not considered suitable in contact with seawater.

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
- 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