Certificate no.:
TAM00001CK

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Thruster Components

with type designation(s)
KT-157B3/B5, KT-187B3/B5, KT-219B3/B5, KT-225B3/B5

issued to
Kawasaki Heavy Industries, Ltd., Harima Works
Kako-gun, Hyogo pref., **Japan**

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.5 Rotating machinery – driven units

Application:

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2024-11-08**
This Certificate is valid until **2029-11-07**.
DNV local unit: **Japan FiS**

for **DNV**

Approval Engineer: **Svein-Olav Hannevik**

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 300,000 USD.

Product description
Bevel gear for tunnel thruster

Application/Limitation
Intended for manoeuvring tunnel thrusters, not intended for vessel with Dynamic positioning notation, with the following main data:

Thruster	Gear ratio	Max input torque [kNm]	Input speed [rpm]	Output speed [rpm]	Power [kW]	Application factor cont. K_A	Application factor peak, $K_{A\ PEAK}$
KT-157B3/B5	16/59	14.8	1160	315	1800	1.05	1.30
KT-187B3/B5	16/63	17.7	1160	295	2150	1.05	1.30
KT-219B3/B5	17/56	27.1	880	267	2500	1.05	1.30
KT-255B3/B5	17/61	32.6	880	245	3000	1.05	1.30

Tooth contact verification shall be carried out for spin test, with reference to results from prototype full torque test (K_{test} = 1.10). Minimum effective length of tooth contact shall be minimum 85%.

Type Approval documentation

Marking of product
The product shall be marked with manufacturer's name or trademark and type number identification.

Periodical assessment
For retention of the type approval, a DNV surveyor shall perform an assessment after 2 years and after 3.5 years, both referring to the issue date of the type approval certificate to verify that the conditions of the type approval are complied with. A renewal assessment will be performed at renewal of the certificate.

In cases where the type approved product is manufactured at other companies, the periodical assessment shall verify that the type approval applicant has a quality control system for consistent production at their licensees/subcontractors. Furthermore, periodical assessment shall be carried out randomly at these companies.

Other conditions
The gears shall be delivered with a DNV product certificate.

END OF CERTIFICATE