

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

Aquadrive HDL680, HDL690, HDL700, HDL700 HT, HDL780, HDL780 HT

Issued to

**GKN Service International GmbH
Rösrath, Germany**

is found to comply with

DNV GL rules for classification – Ships**DNV GL rules for classification – High speed and light craft****Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2018-03-02**This Certificate is valid until **2023-03-01**.for **DNV GL**DNV GL local station: **Essen**Approval Engineer: **Stanislav Avanesov**

**Burkhard Lilienthal
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

Separate thrust bearing and shaft with constant velocity joints

Application/Limitation

The approval is valid for propulsion with the following limitations:

Model	Max. Torque [kNm]	Max thrust [kN]
HDL 680	4,3	40
HDL 690	4.3	40
HDL 700	4,3	40
HDL 700 HT	7,7	40
HDL 780	9,4	60
HDL 780 HT	13,8	60

Type Approval documentation

Marking of product

The product is to be marked with Manufacturer's name or trademark and type number designation.

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform a survey 2 and 3,5 years and before the expiry date of this certificate to verify that the conditions of the type approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

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.

When a Type Approved product is manufactured at other companies, the Type Approval applicant takes the sole responsibility for the conformity of the product to the applicable requirements.