

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Toothed Coupling

with type designation(s)

SB, SBL, SBG, SBR, SRL, SRG, SBD, SBT, VSB, HBk, SBk, SBLk, SBRk, SRLk, SRGk, SBkD, SBkT, LBk, LBLk, LBGk, LBRk, LBRkn, LRLk, LRLkn, SBGk, LRGk, LBkD, LBkT, VLBk, VTHB

Issued to

Renk AG

Rheine Nordrhein-Westfalen, Germany

is found to comply with

DNV GL rules for classification – Ships

DNV GL rules for classification – High speed and light craft

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV GL. The couplings are approved for auxiliary and main propulsion purpose and the approval is valid for standard couplings and for couplings with denomination spec. (special) according to the catalogue RR 070/06.08-3d/e, as well as high speed series according to catalogue RR 068/01.10-3d/e.

Nominal torque see catalogue RR 070/06.08-3d/e, and RR 068/01.10-3d/e

This Certificate is valid until **2021-07-17**.

Issued at **Hamburg** on **2016-07-18**

for **DNV GL**

DNV GL local station: **Essen**

Approval Engineer: **Erich Rüde**

Frank Lutz
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.

Marking of product

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

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform survey every 2.5 years and before expiry date of this certificate to verify that the conditions of the type approval is 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.

Other Conditions

Connections to adjacent shafts are to be approved case-by-case for each delivery.

For the basic construction series, as alternative material for clutch flange and hubs 42 CrMo4-QT can be used within the frame of the existing type approval as well as for existing case by case approvals as substitute to C60+QT / C45N, as far as necessary and depending on availability. This supplement may be applied also for already existing case-by-case approvals. Further, parts with case hardening surfaces are excluded (refer to Job-ID 262.1-005872-4).

DNV GL product certificate is not required for couplings according DNV and the common DNV GL Rules for auxiliary duty with rating up to 500 kW and rated torque less than 5 kNm, where torsional vibration calculations are not required.

The Type Approval Certificate No. TAM00000A8 is replacing the following DNV and GL Certificates:

- | | | |
|-------------------|-----|------------|
| - DNV Certificate | No. | M-12292 |
| - GL Certificate | No. | 6731894 HH |

END OF CERTIFICATE.