DNV·GL

Certificate No:
TAM0000121

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Elastic Couplings

with type designation(s)
TRI, TRI-R

Issued to
Stromag GmbH
Unna, 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.

Issued at **Hamburg** on **2019-02-26**
This Certificate is valid until **2024-02-25**.
DNV GL local station: **Essen**

Approval Engineer: **Wolfgang Schütz**

for **DNV GL**

Olaf Drews
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.

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Product description

Flexible rubber couplings.

Application/Limitation

The coupling series TRI and TRI-R are approved for auxiliary and propulsion duty.

Ratings and coupling charateristics for series TRI according to catalogue "Catalogue D- 866 dated 01.1999" - including the special designs on page 27 - are approved with the following limitations:

- Technical data for the coupling series are approved according to data sheet TM 871.1100 rev. 11.02, where these are different for the catalogue values.
- T_{Kmax1} is approved as given in data sheet TM871.1100, however limited to max. 1.5 x $T_{Kn.}$
- Maximum torques T_{Kmax} as defined in Catalogue No. D 866 of 01.1999 are not covered by the certificate.
- Admissible damping power is the in Catalogue No. D 866 dated 01.1999 values for permanently absorbed damping power i.e. P_{KV} = 0.5 x $P_{KV\ 60.}$
- The permissible damping power as given in TM 871.1100 is valid for 30 °C ambient temperature. For higher temperatures a linear decrease to 105 °C applies.
- Maximum permissible ambient temperature is 70 °C.
- The parametric dependencies for stiffness and damping are given in the type testing reports.

Approved sizes of coupling TRI:

2000	10000	25000	63000
3150	12500	31500	80000
5000	16000	40000	100000
8000	20000	50000	125000

Ratings and coupling charateristics for series TRI-R according to table "TM 886.0100 stand 09.18" with the following limitations:

- Admissible damping power is the in TM 886.0100 stand 09.18 values for permanently absorbed damping power i.e. P_{KV} = 0.5 x $P_{KV\ 60.}$
- The permissible damping power as given in TM 886.0100 stand 09.18 is valid for 30 °C ambient temperature. For higher temperatures a linear decrease to 105 °C applies.
- Maximum permissible ambient temperature is 70 °C.
- The parametric dependencies for stiffness and damping are given in the type testing reports.

Approved sizes of coupling TRI-R:

311 R 312 R 313 R	421 R 422 R 423 R	511 R 522 R 523 R	841 R 842 R 843 R	1141 R 1142 R 1143 R
321 R 322 R 323 R	431 R 432 R 433 R	641 R 642 R 643 R	941 R 942 R 943 R	1241 R 1242 R 1243 R
411 R 412 R 413 R	511 R 512 R 513 R	741 R 742 R 743 R	1041 R 1042 R 1043 R	

For couplings series TRI and TRI-R the connection to driven member is not covered by the approval and details have to be submitted for approval in each separate case. Keyed connections are only permitted for unidirectional drives with low torque amplitudes and insignificant bending stresses.

In general couplings for single propulsion plants have either to be fitted with an emergency claw device or other approved arrangement which could be monitoring and alarm system according to RU-Ships Pt.4, Ch.4, Sec.5 [5].

Type Approval documentation

Marking of product

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

Periodical assessment

For retention of the Type Approval, a DNV GL surveyor shall perform an assessment after 2 years and after 3.5 years to verify that the conditions of the Type Approval are complied with. A renewal assessment will be performed at renewal of the certificate.

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.

Other conditions

DNV GL Product certificate is not required for couplings for auxiliary duty with power rating below 500 kW and rated torque less than 5 kNm, where torsional vibration calculations are not required.

This certificate replaces DNV certificate no. M-12644, GL certificate 12 377 – 98 HH and GL certificate 60 022 – 09 HH.

END OF CERTIFICATE