



TYPE APPROVAL CERTIFICATE

Certificate No:
TAM00000HR
Revision No:
1

This is to certify:

That the Elastic Couplings

with type designation(s)
REVOLEX KX-D

Issued to

KTR Systems GmbH
Rheine, Germany

is found to comply with

DNV rules for classification – Ships
DNV rules for classification – High speed and light craft

Application :

Products approved by this certificate are accepted for installation on all vessels classed by DNV.
The couplings are approved for auxiliary duty not including reciprocating machinery.

Issued at **Høvik** on **2023-04-24**

for **DNV**

This Certificate is valid until **2028-04-23**.

DNV local unit: **Essen**

Approval Engineer: **Wolfgang Schütz**

Oddvar Deinboll
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.

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

Flexible rubber coupling

Application/Limitation

Approved sizes:

| Size | Torque [kNm] NBR 80 ShA | | | Max. Speed [rpm] | |
|-----------|-------------------------|-------------------|--------------------|------------------|-------|
| | Rated T_{KN} | Max. $T_{K\ max}$ | Vibratory T_{KW} | Cast iron | Steel |
| KX-D 75 | 4,30 | 8,6 | 1,72 | - | 4500 |
| KX-D 85 | 5,5 | 11 | 2,20 | - | 4175 |
| KX-D 95 | 7,2 | 14,4 | 2,88 | - | 3845 |
| KX-D 105* | 9,4 | 18,8 | 3,76 | 2000 | 3475 |
| KX-D 120* | 15,2 | 30,4 | 6,08 | 1800 | 3100 |
| KX-D 135* | 20,0 | 40,0 | 8,00 | 1600 | 2725 |
| KX-D 150* | 25,0 | 50,0 | 10,00 | 1450 | 2500 |
| KX-D 170* | 41,0 | 82,0 | 16,40 | 1250 | 2150 |
| KX-D 190* | 54,0 | 108,0 | 21,60 | 1100 | 1900 |
| KX-D 215* | 67,5 | 135,0 | 27,00 | 1000 | 1725 |
| KX-D 240* | 98,0 | 196,0 | 39,20 | 900 | 1550 |
| KX-D 265 | 134,0 | 268,0 | 53,60 | 800 | 1375 |
| KX-D 280 | 170,0 | 340,0 | 68,00 | 720 | 1225 |
| KX-D 305 | 205,0 | 410,0 | 82,00 | 675 | 1150 |
| KX-D 330 | 265,0 | 530,0 | 106,00 | 625 | 1075 |
| KX-D 355 | 350,0 | 700,0 | 140,00 | 575 | 975 |
| KX-D 370 | 430,0 | 860,0 | 172,00 | 535 | 900 |
| KX-D 470 | 520,0 | 1040,0 | 208,00 | - | 855 |
| KX-D 520 | 810,0 | 1620,0 | 324,00 | - | 740 |
| KX-D 590 | 1000,0 | 2000,0 | 400,00 | - | 660 |
| KX-D 650 | 1350,0 | 2700,0 | 540,00 | - | 590 |

* also type SB (with brake disc) approved.

Rated T_{KN} : Rated torque of coupling. Torque that can be continuously transmitted over the entire permissible speed range.

Max. $T_{K\ max}$: Maximum torque of coupling. Torque that can be transmitted as dynamic load $\geq 10^5$ times respectively $5 \cdot 10^4$ as vibratory load over the entire operating life of the coupling.

Vibratory T_{KW} : Vibratory torque of coupling. Torque amplitude of the permissible periodical torque fluctuation with a frequency of 10 Hz and a basic load of T_{KN} respectively dynamic load up to T_{KN} .

The coupling selection is based on operating factors. The coupling has to be dimensioned so that the permissible coupling load is not exceeded during any operating condition. For this purpose, the actual loads have to be compared to the permissible parameters of the coupling. The shaft-hub-connection needs to be verified. For couplings which are loading generated by rated torque operating factor for the ambient temperature and the torsional direction to be considered.

$T_{KN} \geq T_N \cdot S_B \cdot S_t \cdot S_R$ (T_N = rated torque of machine, S_B = operating factor, S_t = temperature factor, S_R = directional factor)

Operating factors for auxiliary applications acc. to KTR catalogue 2023/24, page 19. Further technical data according to KTR catalogue 2023/24 chapter "REVOLEX" (page 77 to 85). Production tolerance on torsional stiffness: $\pm 20\%$.

Coupling hub material to be either nodular cast iron or steel.

Type Approval documentation
Tests carried out

| Test no. | Date | Title |
|----------|----------|----------------------------------|
| 90506036 | | Type test Revolex KX 120 |
| 90506010 | | Type test Revolex KX 170 |
| 90506084 | | Type test Revolex KX 240 |
| 99417057 | 21.11.17 | Type test Revolex KX-D 240 |
| 99418086 | 05.07.18 | Type test Revolex KX-D 150 |
| 99419074 | 13.09.19 | Type test Revolex KX-D-Split 150 |
| 99422051 | 28.06.22 | Type test Revolex KX-D 75 |
| 99422052 | 28.06.22 | Type test Revolex KX-D 170 |

KTR catalogue "Drive Technology" 2023/24

Marking of product

The product to 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 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

DNV product certificate is not required for auxiliary machinery installation with power ratings up to 500 kW and rated torque less than 5 kNm.

The type approval does not cover connection to external shaft.

END OF CERTIFICATE