



# TYPE APPROVAL CERTIFICATE

Certificate No:  
**TAM00000HZ**  
Revision No:  
**1**

## This is to certify:

**That the Bending Compliant Couplings**

with type designation(s)  
**RIGIFLEX-N, RADEX-N**

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.**

Issued at **Høvik** on **2023-04-18**

for **DNV**

This Certificate is valid until **2028-04-17**.

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

RIGIFLEX-N Steel lamina coupling size 35 to 408  
 RADEX-N Steel lamina coupling size 20 to 338

### Application/Limitation

Approved sizes:

RIGIFLEX-N					
Size	Laminae type	Torque [kNm]			Max. Speed [rpm]
		Rated T <sub>KN</sub>	Max. T <sub>K max</sub>	Vibratory T <sub>KW</sub>	[rpm]
35	laminae with 4 holes	0,13	0,26	0,065	23000
50		0,27	0,54	0,135	19000
65		0,55	1,10	0,275	13600
75	laminae with 6 holes	1,10	2,20	0,550	12400
85		1,90	3,80	0,950	11000
110		3,50	7,00	1,750	9000
120		5,75	11,50	2,785	8000
140		10,50	21,00	5,250	6400
160		16,00	32,00	8,000	5600
166		19,00	38,00	9,500	5600
196		22,50	45,00	11,25	5200
216		32,00	64,00	16,00	4600
256		52,50	105,0	26,25	3900
306		86,00	172,0	43,00	3300
346	135,0	270,0	67,50	2900	
406	210,0	420,0	105,0	2500	
168	laminae with 8 holes	25,00	50,00	12,50	5600
198		30,00	60,00	15,00	5200
218		42,50	85,00	21,50	4600
258		70,00	140,0	35,00	3900
308		115,0	230,0	57,50	3300
348		180,0	360,0	90,00	2900
408		280,0	560,0	140,0	2500

RADEX-N					
Size	Laminae type	Torque [kNm]			Max. Speed [rpm]
		Rated T <sub>KN</sub>	Max. T <sub>K max</sub>	Vibratory T <sub>KW</sub>	[rpm]
20	laminae with 4 holes	0,03	0,06	0,015	20400
25		0,06	0,12	0,030	16800
35		0,12	0,24	0,060	13900
38		0,24	0,48	0,120	12000
42		0,32	0,64	0,160	11000
50		0,47	0,94	0,235	9000
60	laminae with 6 holes	0,90	1,80	0,450	8200
70		1,30	2,60	0,650	7300
80		1,80	3,60	0,900	6300
85		2,60	5,20	1,300	5900
90		4,60	9,20	2,300	5400
105		5,60	11,20	2,800	5000
115		9,90	19,80	4,950	4300
135		13,50	27,00	6,750	3700
136		17,50	35,00	8,750	3800
156		25,00	50,00	12,500	3500
166		35,00	70,00	17,500	3300
186		42,00	84,00	21,000	3000
206		52,50	105,00	26,250	2800
246		90,00	180,00	45,000	2300
286		150,00	300,00	75,000	2000
336	210,00	420,00	105,00	1800	

RADEX-N					
Size	Laminae type	Torque [kNm]			Max. Speed [rpm]
		Rated $T_{KN}$	Max. $T_{K \max}$	Vibratory $T_{KW}$	[rpm]
138	laminae with 8 holes	23,00	46,00	11,500	3800
158		33,00	66,00	16,500	3500
168		45,00	90,00	22,500	3300
188		56,00	112,00	28,000	3000
208		70,00	140,00	35,000	2800
248		120,00	240,00	60,000	2300
288		200,00	400,00	100,000	2000
338		280,00	560,00	140,000	1800

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 factor  $S_B$  for marine propulsion 2.5 to 3.0 (plant dependant, actual factor to be decided by KTR). Operating factors for auxiliary applications acc. to KTR catalogue "Drive Technology" 2023/24, page 19. Further technical data according to KTR catalogue "Drive Technology" 2023/24 "Technical Data", page 184 -201.

The approval is valid for auxiliary duty. Approval for "ICE class" notation to be considered in each case.

## Type Approval documentation Tests carried out

Test Report No. 97306070 RIGIFLEX-N 120 Prototype testing.  
 Technische Prüfung der RADEX-N, Grösse 70. Versuch Nr. 71/03.96/29  
 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