



CERTIFICATE NUMBER
EFFECTIVE DATE
EXPIRY DATE
ABS TECHNICAL OFFICE

20-1961525-PDA
15-May-2020
14-May-2025
Hamburg Engineering Department

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

KTR SYSTEMS GMBH

located at

CARL-ZEISS STR. 25, D-48432 RHEINE, Germany

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product Couplings

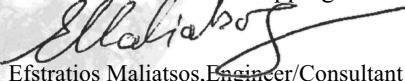
Model RADEX-N NANA, Size 25 to 338
RIGIFLEX-N A, Size 35 to 408

This Product Design Assessment (PDA) Certificate remains valid until 14/May/2025 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping



Efstratios Maliatsos, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

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Tier: 5 - Unit Certification Required

Product: **Couplings**

Model: **RADEX-N NANA, Size 25 to 338**

RIGIFLEX-N A, Size 35 to 408

Intended Service:

Steel lamina couplings for marine auxiliary drives- Special Purpose Couplings for Petroleum, Chemical and Gas Industry Services

Pumps, compressors, fans applications.

Description:

The RADEX-N NANA / RIGIFLEX-N A coupling is a torsional flexible type coupling that compensates axial, radial and angular displacements of the connected machinery. The couplings could be fitted horizontally or vertically.

The RADEX-N NANA/ RIGIFLEX-N A are a lamina coupling designed with or without feather key. The lamina sets are connected to hubs and spacers. Dowel screws or special pins are alternately screwed to hubs and spacer enabling a combination of frictional engagement and positive locking.

The RADEX-N NANA/ RIGIFLEX-N A type coupling consists of two hollow hubs with integrated flange at one end, a spacer, laminated disc packs, bolts and nuts.

The coupling hubs are bolted at the flanges with flexible stainless steel laminated disc packs and the spacer.

The hubs bores have key ways for other shaft connections through feather keys and a slot on the hub to assist in screw clamping of the shaft.

See attached "catalogue" for details

Rating:

For approved ratings click on link 'Overview'.

Radex-N NANA Size 25 to 338

Torque Nominal (Operational): 60 Nm to 280,000 Nm

Maximum Rated Torque: 120 Nm to 560,000 Nm

Maximum Rated Speed: 20,000 rpm

Design Temperature (Min/Max): -30/+280° C.

Permissible misalignment, angular 1° RADEX-N 25 - 135

Permissible misalignment, angular 0.5/ 0.7° RADEX-N 136 - 338

RIGIFLEX-N A Size 35 to 408

Torque Nominal (Operational): 130 Nm to 280,000 Nm

Maximum Rated Torque: 260 Nm to 560,000 Nm

Maximum Rated Speed: 23,000 to 2,500 rpm

Design Temperature (Min/Max): -30/+280° C.

Permissible misalignment, angular 0.5/ 0.7°

Service Restriction:

1. Unit Certification is required for this product based on application as per 4-1-1/ Table 2 of the Marine Vessels Rules and Chapter 3 Section 2 Tables 1 and 2 of the Guide for the Certification of Drilling Systems as applicable.
2. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.
3. Material Testing may need to be witnessed by the Surveyor as per applicable requirements in 4-3-2/3 of the Marine Vessels Rules and Chapter 5 of the Guide for the Certification of Drilling Systems.
4. Coupling to be used for drilling system equipment and/or component materials are to comply with the toughness requirements as per 6/5.1 of the Guide for the Certification of Drilling Systems.

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Comments:

1. Note that the Feather Key is not supplied by KTR System GmbH and hence not in the scope of this review.
2. Toughness test must be carried out to meet the requirements specified in 2020 MOU 6-1-9/Table 1.
3. Coupling bolts will be accepted on the basis of the material manufacturer's certified test reports and a satisfactory surface inspection and hardness check witnessed by the Surveyor. Coupling bolts manufactured to a recognised bolt standard will not require material testing.
4. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

Notes/Drawing/Documentation:

Drawing No. 10090en000001, steel lamina properties, Revision: -, Pages: -
Drawing No. 57180en000000, ATEX RADEX H, Revision: -, Pages: -
Drawing No. 57480en000000, ATEX RIGIFLEX N, Revision: -, Pages: -
Drawing No. Cert-GOST-R, RU GOST certificate, Revision: -, Pages: -
Drawing No. Correspondence, email 1 of April 21st, Revision: -, Pages: -
Drawing No. Correspondence, email of 21-02-2020, Revision: -, Pages: -
Drawing No. Correspondence, Email of April 30th, Revision: -, Pages: -
Drawing No. Correspondence, request form, Revision: -, Pages: -
Drawing No. Correspondence, email 4 of April 21st, Revision: -, Pages: -
Drawing No. Correspondence, email 3 of April 21st, Revision: -, Pages: -
Drawing No. Correspondence, Email 2 of April 21st, Revision: -, Pages: -
Drawing No. EAC_EX-TR-CU-012-Couplings, RU Ex certificate, Revision: -, Pages: 6
Drawing No. RADEX-N 136-338 Zeichnungen, None 4, Revision: -, Pages: -
Drawing No. RADEX-N 25-135 Zeichnungen, None 2, Revision: -, Pages: -
Drawing No. RIGIFLEX-N 166-408 Zeichnungen, None 3, Revision: -, Pages: -
Drawing No. RIGIFLEX-N 35-160 Zeichnungen, None 1, Revision: -, Pages: -
Drawing No. Technial inquiry, email of May 4th technical responce, Revision: -, Pages: -
Drawing No. certificate_by_14001_en, ISO certificate, Revision: -, Pages: -
Drawing No. certificate_by_9001_en, ISO document, Revision: -, Pages: -
Drawing No. example-drw-M 797194, Drrawing example, Revision: -, Pages: -
Drawing No. overview, overview, Revision: -, Pages: -
Drawing No. overview 1, overview 1, Revision: -, Pages: -
Drawing No. proof of strength RADEX-N couplings_04-2020_ABS, calculation 1, Revision: -, Pages: -
Drawing No. proof of strength RIGIFLEX-N couplings_04-2020_ABS, calculation 2, Revision: -, Pages: -
Drawing No. steellaminar couplings, catalog RADEX and RIGIFLEX, Revision: -, Pages: -

Terms of Validity:

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STANDARDS

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ABS Rules:

- Marine Vessels Rules (2020): 1-1-4/7.7, 1-1-A3, 1-1-A4, 4-1-1/Table 6, 4-3-2/1.1, 4-3-2/1.5, 4-3-2/3.1, 4-3-2/3.7, 4-3-2/5.1, 4-3-2/5.3, 4-3-2/5.19, 4-3-2/9.7, 4-3-5/5.7.3
- Mobile Offshore Units Rules (2020): 1-1-4/9.7, 1-1-A2, 1-1-A3, 2-1-4/5/7/9, 2-1-7/11, 2-3-2/9, 4-1-1, 6-1-4/ Table 1, 6-1-7/3.1, 6-1-7/5.11, 6-1-9/9/ Table 1, 2,
- Facilities on Offshore Installation Rules, (2020) 1-1/A2, 1-1/A3, 3-2/Table 2, 5-1/3.3.3,
- Classification of Drilling Systems Guide (2019), 1-1/A2, 1-1/A3, Chapter 3 Section 2 Tables 1 and 2, 2-5/7.1, 2-7/9.7, 3-2/Table 2/3/4
- High-Speed Craft Rules (2020) 1-1-A2, 1-1-A3

National:

DIN EN ISO 4762 2004-06

DIN EN 292 part 2 2000-06

ATEX 2006-04

GOST R / GOST TR 2017-12

International:

ISO 13709: 2010-05

ISO 14691: 2008-12

ISO 10441: 2007-07

API STD 610 Edition 11th: 2010-09

API STD 671: 2007-08

Government:

NA

EUMED:

NA

OTHERS:

NA