

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Elastic Couplings

with type designation(s)
VULKARDAN E

Issued to

**Vulkan Kupplungs- und Getriebebau Bernhard Hackforth
GmbH & Co. KG**
Herne, 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 **2020-05-29**

This Certificate is valid until **2025-05-28**.

DNV GL local station: **Essen**

for **DNV GL**

Approval Engineer: **Wolfgang Schütz**

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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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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

Highly Flexible Elastomer Coupling

Place of production

Vulkan Kupplungs- und Getriebebau B.Hackforth GmbH & Co.KG, Herne Germany

Application/Limitation

The coupling series are approved for auxiliary and propulsion duty. Ratings and coupling characteristics according to catalogue "VULKARDAN E" (edition 07/2019) and with limitations as given in the certificate. Permissible damping power and other coupling characteristics to be adjusted for the actual application according to the guidelines given in the catalogue "VULKARDAN E" (edition 07/2019) and for other ambient temperatures, vibratory torques and mean load as per documentation in the below mentioned test reports.

Stiffness and damping properties as per "Explanation of technical data" (edition 07/2019) and for other ambient temperatures, vibratory torques and mean loads. Duty-Class factor "C – continuous service" to be applied.

Permissible power loss as given (P_{KV30}) in the catalogue are valid for 30°C ambient temperature.

Permissible power loss for couplings in bell housing and/or at higher ambient temperatures than 30 °C to be calculated according to the following formulas:

Couplings with natural rubber elements:

$$P_{KV} = P_{KV30} \left(\frac{110 - t}{80} \right) \quad t : \text{ambient temperature}$$

Couplings with silicone elements:

$$P_{KV} = P_{KV30} \left(\frac{150 - t}{120} \right) \quad t : \text{ambient temperature}$$

For VULKARDAN E couplings ambient temperatures up to 90°C for natural rubber and up 120°C for silicone are permissible.

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].

Approved sizes of "VULKARDAN E":

VULKARDAN E					
Dimension Group	Size				
	Natural Rubber				Silicone
K1710	K1714	K1711	K1715	K1712	
K2310	K2314	K2311	K2315	K2312	
K2410	K2414	K2411	K2415	K2412	
K2810	K2814	K2811	K2815	K2812	K2811S
K3210	K3214	K3211	K3215	K3212	
K3410	K3414	K3411	K3415	K3412	K3411S
K4010	K4014	K4011	K4015	K4012	K4011S
K4110	K4114	K4111	K4115	K4112	
K4810	K4814	K4811	K4815	K4812	
K4910	K4914	K4911	K4915	K4912	K4911S
K6010	K6014	K6011	K6015	K6012	K6011S

The coupling sizes K54xx and K57xx are also included in this type approval, although they are not mentioned in the table above. However, at Vulkan's request, they are to be replaced by the VULKARDAN

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Certificate No: **TAM000015Y**

F F54 or F57 couplings. For the "After Sales Service" of the coupling sizes K54xx and K57xx this type approval remains valid.

Type Approval documentation

Tests carried out

Test reports nos. ;
121E (4012), 122E (2814), 123E (4011), 124E (4015), 125E (4011 S), 136E (Power loss 4915), 147E (Power loss 3411), 468E (6015), 3519E (4915).

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 GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Sec.4.

Other conditions

This certificate replaces LGL certificate 15516-00 HH and LDNV certificate no. M-12548.

END OF CERTIFICATE