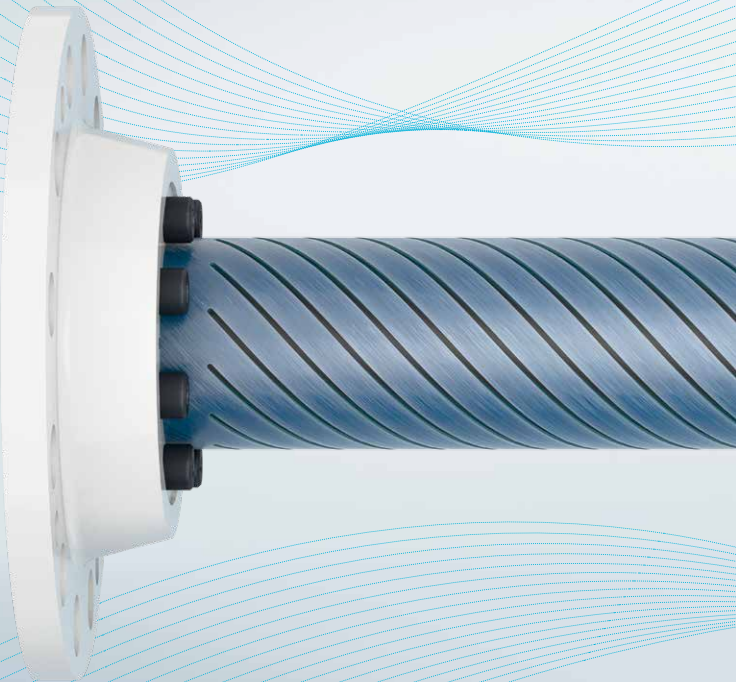


VULKAN

# The patented N-Flex<sup>®</sup> flexible drive shaft

*We ensure that systems work better.*



Drive shaft technology by

 **NEMOS**

# Flexible drive shafts - our all-in-one solution!

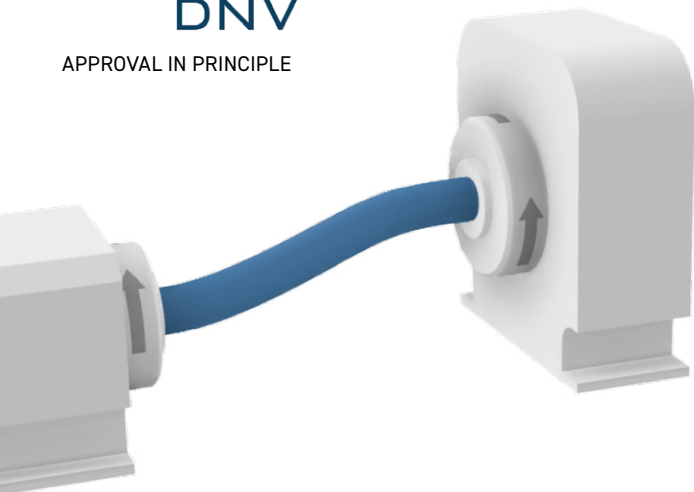
The new VULKAN N-Flex® drive shaft is based on the patented NEMOS technology featuring a design consisting of fiber-reinforced composite and elastomer material.

It offers a unique combination of torsional elasticity and high displacement capacity in one single component.

The N-Flex® combines the functions of elastic couplings and drive shafts, reducing the number of components and mass of the driveline.



APPROVAL IN PRINCIPLE



## Benefits

- ⊕ High torsional elasticity
- ⊕ High flexibility in axial, radial, and angular direction
- ⊕ Maintenance free
- ⊕ Good structure-borne noise isolation
- ⊕ Weight reduction
- ⊕ Low reaction forces
- ⊕ Corrosion resistant
- ⊕ Long unsupported shafts
- ⊕ Customized design possible



## Markets

- ⊕ Marine Applications
- ⊕ Industrial Applications



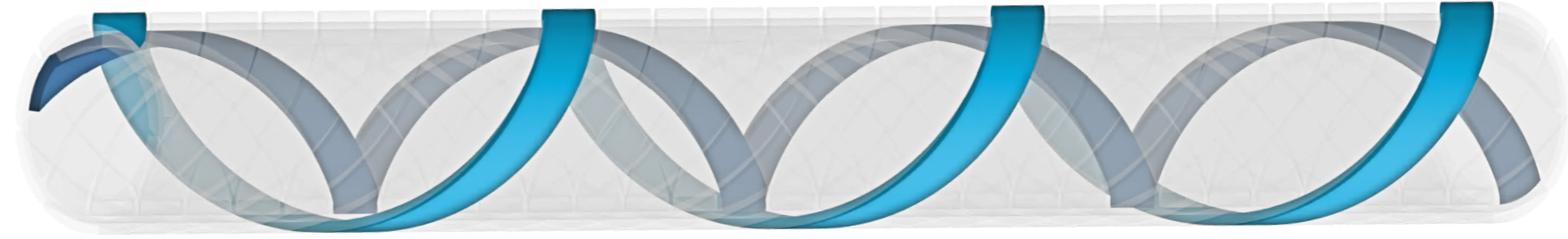
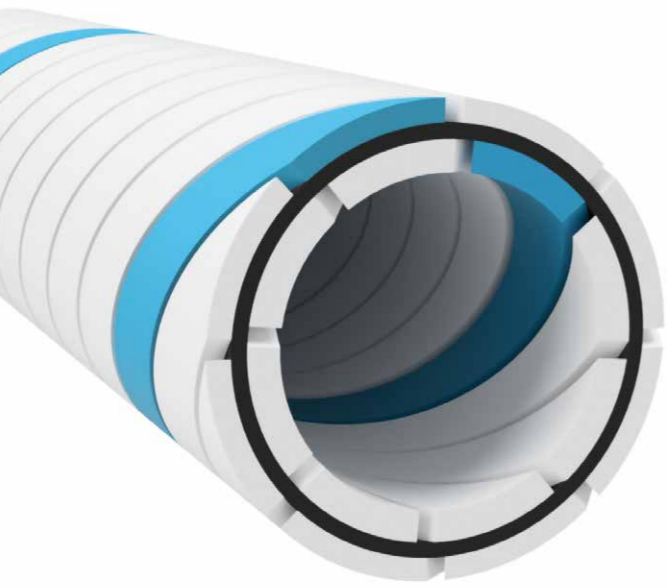
## Specifications

- ⊕ Torque: up to 20 kNm
- ⊕ Length: up to 5 m
- ⊕ Angular displacement: up to 2° per flexible section
- ⊕ Radial displacement: up to 20 mm/m
- ⊕ Axial displacement: 1 % of flex-length
- ⊕ Operational temperature: 5 – 55 °C
- ⊕ Acoustic damping: 70 – 100x higher than steel shaft

# Flexible drive shaft with high displacement capacity and excellent torsional elasticity

## The NEMOS Technology

The N-Flex® drive shaft design is based on the patented NEMOS technology. Unidirectional glass fibers are arranged in two layers of composite coils, transmitting the torque of the drive train. The outer set of coils is purely tension-loaded while the inner coils are compression-loaded, resulting in radial and axial equilibrium of forces.



The composite coils of each layer are decoupled by gaps, the outer and inner layer are decoupled by high-performance elastomer material. This allows the coils to remain bending compliant which enables the entire shaft to be flexible in multiple directions. Additionally, the decoupling induces a virtually unidirectional force transmission through the composite coils which means high strains can be applied resulting in an excellent torsional elasticity.

## Benefits

**The N-Flex® drive shaft uniquely combines many customer requirements in one single maintenance-free component.**

The flexible design compensates for axial, radial and angular displacements and vibrations of the drive components as well as torsional vibrations induced by the engine and offers a high structure-borne noise isolation.

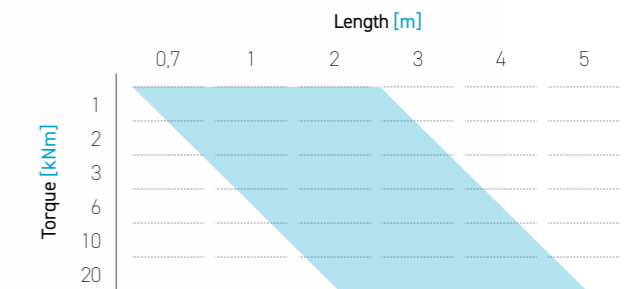
A reduction of components in the drive train can be achieved by one integral product: the **N-Flex®**.



## Status and Outlook

**The N-Flex® drive shaft is developed in cooperation between VULKAN and NEMOS.** Extensive simulations, material and component tests have been performed. In 2022, DNV granted the N-Flex® drive shaft an Approval in Principle (AiP). Further certification steps are in progress. The N-Flex® drive shaft will be available for the maritime market soon – in standard dimensions or as a custom-design. Contact us to find out how the N-Flex® can improve your application.

## Standard Dimensions



Custom dimensions available on request.