

## **Dredging vessels rely on Stromag clutches and couplings**

**Many harbours and canals owe their existence to dredging vessels. Designed to suck sediment up from the depths, these vessels help to combat sedimentation to ensure safe access for shipping. Pumping up sand, stones and clay places large stresses on a dredger's powertrain, fortunately Stromag is a leading provider of clutches and couplings for these robust, hard-working vessels.**

### **The challenges of dredging**

Dredgers come in many shapes and sizes. Two principal designs are trailing suction hopper dredgers (TSHDs) and cutter suction dredgers (CSDs). TSHDs operate like a vacuum cleaner, sucking up sediment using pumps and transferring it to on-board hoppers. CSDs are similar, but feature a large cutting head designed to loosen compacted sediment before it is sucked up by the vessel. Designs can also feature jet pumps, which blast water at the sediment to suspend it in water for easy collection.

Despite numerous configurations, all will feature a powertrain for the propulsion and the pumping systems. Components in these systems must be robust, reliable and flexible. Sucking up large amounts of sediment puts large shock loads through the powertrain. Resiliently mounted engines move inside the hull, which means the powertrain must accommodate this movement reliably.

As dredgers are often key components in harbour maintenance or large-scale projects, dredger downtime is very undesirable. In some cases, an unforeseen breakdown leading to a lost day of dredging can cost operators between \$200,000 USD to \$350,000 USD. Failures can also leave sediment in pipes, necessitating costly and time-consuming removal.

### **The dredging powertrain expert**

A focus on supplying reliable powertrain solutions to marine gearbox manufacturers and shipbuilders means that Stromag is a preferred vendor for this challenging application. A global manufacturer of brakes, clutches and couplings and a leading brand of Altra Industrial Motion Corp., Stromag offers a highly proficient selection of products for use in dredgers. Specialising in marine propulsion and onboard pump systems, the business can provide clutches and couplings to maximise dredger uptime.

*"We are an established solution provider for these rugged vessels," Dennis Heine, Global Product Manager at Stromag explains. "Our products are utilised by leading gearbox manufacturers and shipbuilders. Customers trust our solutions due to our proven track record of performance and reliability. Large manufacturing capacity, a wide range of products and service flexibility ensures that we are a capable partner."*

### **Clutches**

Stromag offers a wide range of clutches ideal for dredgers. The business supplies to leading marine gearbox manufacturers, as well as delivering external clutches to engage and disengage onboard systems such as pumps.

The KMS multi-disc hydraulic clutch is designed specifically to meet the needs of marine propulsion systems. A torque rating of up to 2,000,000 Nm within a compact design ensures that the engagement/disengagement requirements of dredgers and much larger vessels can be met.

*"As well as providing clutches for mounting outside the gearbox, we also provide clutches to gearbox manufacturer specifications for integration into the unit," Dennis adds. "Whether we are supplying a clutch for the main propulsion system or to engage and disengage drive to the pump system, we assess the power, space, speed and moment of inertia to provide an exact solution for the needs of each customer. This includes the provision of custom interfaces so that the clutch can seamlessly integrate with the rest of the powertrain."*

## **Couplings**

With multiple high-powered systems operating on dredgers, it's natural that robust shaft connections are required.

Stromag's TRI-R coupling is designed specifically to work with resiliently mounted engines. Able to accommodate torsional, axial and radial misalignment as the engine moves on its mounts, the TRI-R ensures this movement causes no undue stresses on associated powertrain components thanks to an internal rubber element.

Another flexible Stromag coupling is the GE, a highly compact design with a torque rating up to 270,000 Nm. Rubber-fabric construction ensures flexibility, ensuring that it is optimal for fitment directly to the engine flywheel.

*Dennis says: "We can tailor coupling specifications to the requirements of each powertrain. For example, we have a wide range of proven rubber compounds for the flexible element that we select based on torsional vibrational analysis, which means we can minimise resonance throughout the system, maximising reliability. Our couplings are equally suitable for use in the main propulsion system or on the dredge pump side."*

## **2in1**

The 2in1 combination of a clutch with a flexible coupling is a key Stromag offering, one that allows gearbox manufacturers and shipbuilders to benefit from a fully integrated solution that saves space and ensures reliability.

*"Our 2in1 solutions are popular for dredging applications," Dennis explains. "Recent projects have involved combining our TRI-R coupling with a KPR pneumatically actuated single membrane clutch for a dredger in the Netherlands. For another project we combined our GSF conical clutch with TRI-R and GE couplings. We can tailor these 2in1 combinations to suit customer specification and powertrain data."*

As well as offering compatibility with its own clutches, Stromag has collaborated with another leading Altra brand, Wichita Clutch, to combine its TRI-R coupling with a Wichita switchable clutch.

### **Established expertise**

With dredging vessels coming in a wide range of configurations with multiple onboard powered systems, specifying clutches and couplings from a proven expert can greatly improve reliability. A flexible approach, whether providing solutions for the main propulsion or pump system – ensures that Stromag can deliver highly reliable solutions optimised for each vessel. As a global clutch and coupling OEM, gearbox manufacturers and shipbuilders can benefit from not only highly proficient and specialist products, but worldwide access to technical knowledge and maintenance support too.

### **Image Captions:**

**Image 1-2:** Dredging vessels come in many shapes and sizes. (Image Source: 1: iStock\_22733921 / 2: iStock-517381857)

**Image 3:** The KMS multi-disc hydraulic clutch is designed specifically to meet the needs of marine propulsion systems.

**Image 4:** Stromag's TRI-R coupling is designed specifically to work with resiliently mounted engines. Able to accommodate torsional, axial and radial misalignment as the engine moves on its mounts.

**Image 5:** Stromag's GE coupling is a highly compact design with a torque rating up to 270,000 Nm.

**Image 6:** The 2in1 combination of a clutch with a flexible coupling is a key Stromag offering, one that allows gearbox manufacturers and shipbuilders to benefit from a fully integrated solution that saves space and ensures reliability.

## About Stromag

Founded in 1932, Stromag has grown to become a globally recognized leader in the development and manufacture of innovative power transmission components for industrial drivetrain applications. Stromag engineers utilize the latest design technologies and materials to provide creative, energy-efficient solutions that meet their customer's most challenging requirements.

Stromag's extensive product range includes flexible couplings, disc brakes, limit switches, an array of hydraulically, pneumatically, and electrically actuated brakes, and a complete line of electric, hydraulic and pneumatic clutches.

Stromag engineered solutions improve drivetrain performance in a variety of key markets including energy, off-highway, metals, marine, transportation, printing, textiles, and material handling on applications such as wind turbines, conveyor systems, rolling mills, agriculture and construction machinery, municipal vehicles, forklifts, cranes, presses, deck winches, diesel engines, gensets and stage machinery.

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