

Laser-textured discs improve marine engine performance

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A laser-textured friction disk could reduce maintenance costs and downtime for the biggest ships sailing on the oceans. Man Energy Solutions tested laser-textured friction disks on its two-stroke engines on two ships sailing from Europe to Asia.

Friction disks transfer power in engines and act as a safety device. They need to sustain a precise amount of friction: too much and the gear can be overloaded, too little and there could be premature slippage. Currently, disks are treated with a thermal spray coating to help them create friction. However, this method isn't as precise as the [engine](#) and the industry need.

Scientists from Heriot-Watt University in Edinburgh worked with Man Energy Solutions and TRD Surfaces in Denmark to develop a new laser-texturing process for the disks.

Professor Duncan Hand from Heriot-Watt University said: "Using lasers means we can create precise, uniform and replicable textures on the disks. We used [laser pulses](#) to experiment with different patterns, shapes, spacing and depths, with the aim of creating a new surface that would have a good grip on its counterpart."

The high-friction concept was combined with a surface hardening process, carried out by TRD Surfaces. It effectively freezes the textured surface to ensure it doesn't deform when it comes into contact with its counterpart. The technique was tested extensively in the laboratory at Heriot-Watt and then on a specialist demonstrator.

Hand said: "We achieved a much higher and more reproducible friction coefficient than we had expected. Improving the performance of the disks means significant savings on maintenance costs, which the shipping

industry will welcome."

Jesper Vejlø Carstensen from Man Energy Solutions said: "We needed a better solution for one of our high-friction components. After joining forces with Heriot-Watt and TRD Surfaces, we now have a precise, controllable and reproducible solution. As a vital add-on, we can perform non-destructive quality control of every part, and are installing the [laser](#) surface textured high [friction](#) disks in engines "

Provided by Heriot-Watt University

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