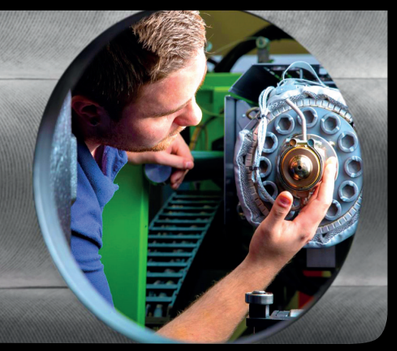
Tribosonics' sensor technology innovation transforms machine builder ENGEL's customer maintenance cycles

A ground-breaking collaboration between a sensor innovator and OEM has developed a digital technology solution to reduce maintenance costs and downtime, while increasing productivity and energy efficiency.

> *"Our innovative collaboration with ENGEL demonstrates how important it is to work together to find the best solutions which can benefit industry and the planet."*



ENGEL, a global leader in the manufacture of plastics processing machines, based in Schwertberg, Austria, partnered with Tribosonics, a Sheffield-based scale-up using sensing technology to tackle wear, friction, and lubrication challenges in industrial applications.

Nicole Ballantyne, Knowledge Transfer Manager for Digital Manufacturing at KTN, said: *"The achievement by ENGEL and Tribosonics is a superb example of the ground-breaking innovation that can be achieved through collaboration, and precisely what the Made Smarter Innovation Network is aiming to replicate over the next four years in its role of joining communities together to drive positive change and transform UK manufacturing."*

THE INSPIRATION

ENGEL's machines produce anything from toothbrushes to lighting systems on cars and from toys to packaging for beverages.

It was introducing its Inject 4.0 portfolio, which captures weight, flow and vibration measurements within the machine and enables customers to make real-time data-driven decisions to increase machine availability and productivity.

However, it was struggling to measure the wear on the plasticising feed screw, a key component in the process which influences the product's quality, because it is fully enclosed and cannot be accessed from the outside.

Paul Kapeller, Head of Product Management Digital Solutions at ENGEL, explained: *"Our customers were faced with a difficult choice in maintaining these screws, both resulting in downtime and cost implications. Preventative maintenance to manually check the screw wear could put the machine out of action for two days, whereas reactive maintenance meant they would only react when the wear impacted process or product quality. We wanted to develop a solution to look into the screw barrel without disassembling it and avoiding downtime."*

THE INNOVATION

Unable to find a sensing solution that could withstand the extreme temperatures produced in the polymer process, ENGEL partnered with Tribosonics, a business innovating in sensor technology. The aim was to develop a monitoring system that a technician could set up and use within minutes to accurately evaluate a screw's condition and determine if it needs replacing.

The solution was a real-time monitoring system which uses an ultrasonic high temperature transducer on the outside of the machine to send a wave to a pulser receiver to detect and record changes to the screw.

These real-time measurements are uploaded to a digital platform, automatically analysed against previous data, and reported to the customer.

THE IMPACT

The innovation has transformed the maintenance cycle for ENGEL's customers, reducing the time it previously took to ascertain the screw wear from two days to one hour, saving significant costs from unnecessary or unplanned maintenance, while increasing machine uptime, productivity and energy efficiency, and reducing the waste from producing scrap components.

Meanwhile, machine operators previously involved in the manual stripping and measuring process will be upskilled in intelligence-based decision-making to monitor and plan maintenance.

ENGEL can now offer the value-added service to new customers and retrofit older machines, offering further opportunity to maximise revenues.

For Tribosonics, the collaboration has resulted in patented sensor technology it can now look to apply in other sectors, and further cements its position as a high-tech scale-up at the forefront of Industry 4.0 using innovation to drive digital transformation and tackle some of the industry's key challenges.

Christina King, Chief Commercial Officer at Tribosonics, said: *"Research shows 3% of the world's total energy consumption is used to remanufacture worn parts and spare equipment due to wear and wear-related failures. By addressing friction and wear, there is the potential to reduce energy consumption by 40% in the long term, which on a global scale amounts to savings of 1.4% of GDP, 8.7% of total energy consumption, and a reduction of CO_2 emissions by up to 3,140 metric tons.*

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