



## Industry Case Study

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**Fenner Precision Polymers**

**A Michelin Group Company**

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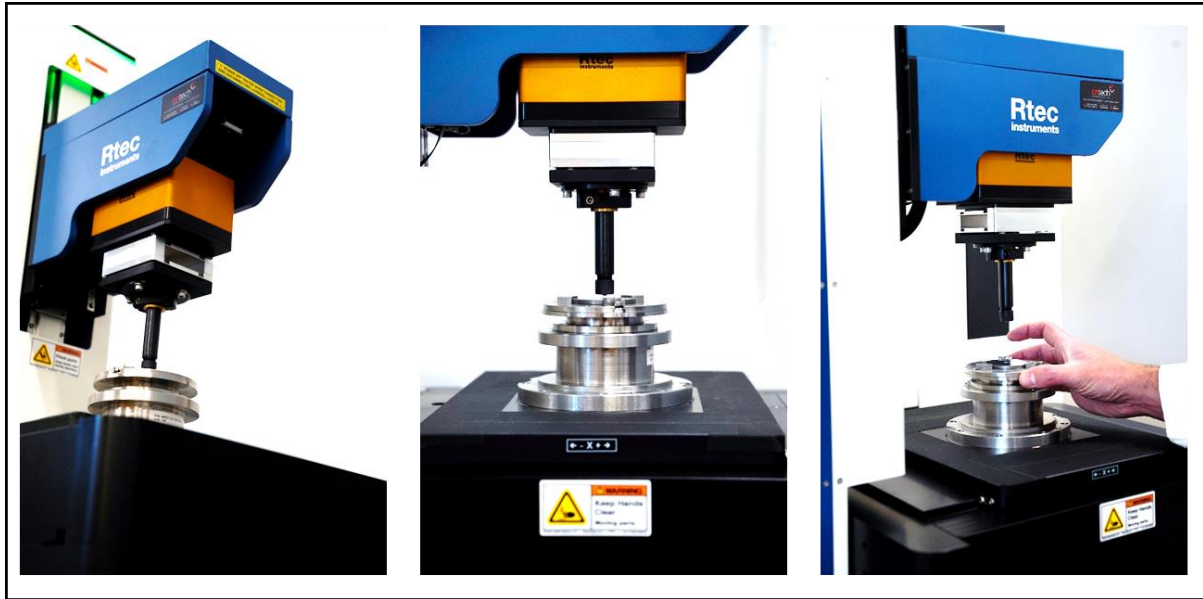
# Collaborative use of Tribometry to Enhance Elastomeric Product Performance

## Challenge

Fenner Precision Polymers, a Michelin Group Company, based in the heart of Lincoln, UK, develop and manufacture elastomeric materials for a range of industrial applications. Fenner Precision Polymers' products are required to withstand a wide range of demanding operating conditions and improving product lifetime is a key customer demand.

Tribometry is the study of wear using techniques such as the "pin on disc" method to apply known forces between two materials of interest. As such, the Rtec MFT 2000 Tribometer, located in the Bridge (Figure 1), was the ideal tool to help Fenner Precision Polymers understand and benchmark the wear properties of a current conveyor belt product and allow comparison with re-formulated product designs.

The MFT 2000 instrument can be configured in a number of different ways to allow different testing regimes to be applied to materials of interest such as rotating and reciprocating contact regimes and measurements at high (up to 500°C) temperature. The instrument provides a range of outputs to characterise wear properties including the co-efficient of friction, material hardness and depth of wear.



**Figure 1.** Photographs of Rtec MFT 2000 tribometer located in the Bridge. The instrument is shown with the rotary stage in place.

Application of tribometry to Fenner Precision Polymers industry challenge allowed them to characterise the wear behaviour of their elastomer materials in use without the need to scale up to production trials which are costly and take up manufacturing time. Ultimately, by improving the wear resistance of the material, it was envisaged that Fenner Precision Polymers would be able to increase their product offering and strengthen customer relations.

## Approach

A collaborative approach was taken to the project to develop a tribometer method that was representative of in-use conditions and would represent a realistic wear profile of the materials under investigation. This initial method development resulted in the establishment of a routine method, representing a novel methodology for the use of tribometry in elastomeric materials.

Following method co-development and training of Fenner Precision Polymer's technical team in the use of the tribometer, Fenner Precision Polymers performed wear measurements independently during their product re-design process, effectively using the Bridge as an extension of their in-house R&D capabilities.

Over a period of several months, a range of alternative materials and product designs were assessed by Fenner Precision Polymers allowing them to optimise development of a new product with improved wear characteristics.

## Outcomes

As a result of the project, a new product has been developed with improved wear resistance, under relevant operating conditions, allowing the company to maintain competitiveness within their market sector. In addition, the development project helped Fenner Precision Polymers to increase understanding of their products and behaviour in use without the upfront requirement of potentially costly production trials.

By working collaboratively and accessing the Bridge as an extension of their own in-house R&D capability, they also contributed to the professional development of their employees by equipping them with new skills and knowledge to help the business in future.

Working with Fenner Precision Polymers on this project also enabled the Bridge to develop further understanding on the use of the tribometry to elastomeric materials strengthening expertise in this area.

## Summary

Tribometry was applied to an elastomeric product of Fenner Precision Polymers which facilitated the development of a novel product with improved product characteristics. The study showcases how industry partners can work with the Bridge to develop new materials and enhance product performance.

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## Bridge

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