

Quality food and feed enzyme development at the industrial scale

The use of enzymes as biocatalysts in industrial applications has steadily gained popularity, as it offers an efficient way to use raw materials while minimizing waste. This approach has been successfully scaled for commercial processes in the pharmaceutical, food and beverage industries, largely thanks to the use of automation to screen, optimize and produce suitable enzymes. Roal Oy in Rajamäki, Finland – a leading producer of industrial enzymes – has automated large parts of its enzyme discovery and screening activities to accelerate product development and optimization.



Roal relies on a number of Tecan automation workstations across its R&D and QC departments to ensure accuracy

The Art of Enzymes roal

Enzymes have become increasingly common in industrial applications of the past century and are now widely used in the food, agricultural, pharmaceutical and cosmetics sectors. The main benefit of enzyme-catalyzed processes over chemical reactions is that they are more efficient and better controlled, enabling very cost-effective development of specific final products while minimizing raw material use.

Roal Oy – a subsidiary of Associated British Foods and Anora – is one of the world’s largest enzyme companies, creating a wide range of products for different applications across the food, technical and feed industries, specializing in *Trichoderma*, *Aspergillus* and *Bacillus* fermentations. Dr Kari Juntunen, Senior Research Scientist at Roal, explained: “Our main markets are the feed industry – predominantly producing xylanases and phytases – and the food sector, including amylases, proteases and pectinases. In addition, we make cellulases and xylanases for the paper and pulp industry, and enzymes for detergent applications, as well as a number of products for other industries.”

Roal’s Research and Development Department uses automation extensively in its workflows, enabling efficient molecule screening and enzyme development, as well as quality control activities. The company has a long experience using Tecan’s

products. Dr Janne Wallenius, Senior Research Scientist, commented: “We originally chose to purchase instruments from Tecan because we needed to increase our liquid handling capabilities and throughput in R&D, and the best way to do that was by investing in an automated system. We started with a Freedom EVO® liquid handling workstation and, when even better pipetting capabilities and more flexibility were required, we purchased two Fluent® Automation Workstations. This was an easy choice, since we were already accustomed with the brand, and intuitively knew how to use the systems.”

“We now have a number of Tecan platforms here in Rajamäki, in both R&D and QC,” Kari added. “The QC team uses its system for routine activity analysis of products, whereas our instruments in R&D are mainly used for new enzyme discovery and screening, meaning they need to be much more flexible for developing new methods. In addition, our sister company AB Enzymes GmbH in Darmstadt, Germany – which sells many of our products – also has a number of Tecan platforms, allowing smooth transfer of protocols between sites.”

Janne continued: “We use the Fluent systems extensively for cloning and screening, providing consistency for our analyses and increasing our throughput for enzyme discovery and screening, while also reducing monotonous manual work. We also have Spark® and Infinite® 200 PRO M Plex plate readers integrated into our platforms for absorbance measurements, allowing fully

automated quantitative analyses to assess the individual activities of libraries of variants. Each of our systems also has a Pickolo™ Colony-Picker from SciRobotics for hit-picking and cultivation, and both the hardware and software of this device integrate seamlessly into the Fluent.”

“The Fluent is user friendly and offers a sterile and safe work environment, minimizing the strain of repetitive pipetting. I really like that you can tune the set-up of the system to suit different purposes, and that it is possible to add on modules, such as integrated readers and heaters. The FluentControl® software makes it easy to implement new features and devices. Just as importantly, we have a good relationship with Tecan’s local distributor here in Finland – Triolab Oy – so we are confident that we will receive good technical and service support,” concluded Kari.

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**For more information about
Roal Oy, visit www.roal.fi**

**To find out more about Tecan’s
Fluent Automation Workstation,
visit tecan.com/fluent**

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