CASE STUDY: RAWWATER APPLIED TECHNOLOGY LTD

THE BRIEF

Rawwater Applied Technology Ltd was established to develop and exploit leak-sealing technologies and solutions in industrial settings.

The company has developed a technology it calls 'M3', which comprises a range of specialist, bismuth-based alloy seals and application techniques for use in nuclear decommissioning, power transmission (sealing greenhouse gas leaks from small bore pipework) and other high-risk industrial sectors. Rawwater has had limited exposure to digital solutions as development has been experimental to date.

THE APPROACH

Rawwater Applied Technology's project with the Virtual Engineering Centre (VEC) focused on its M3 alloys. Short for Molten Metal Manipulation, the M3 technology provides the opportunity for in-service, reversible metal seals for the rapid recovery of leaks and cracks in civil structures, seals, joints, flanges and pipelines, as well as for planned preventive maintenance.

Rawwater's product development was centred around experimental R&D – something that can be hugely expensive, both in terms of time and resources. The company, however, understood that the M3 product development process could possibly be made more efficient through the integration of modelling and simulation in the design process, allowing multiple designs and parameters to be tested virtually. As Rawwater had not undertaken anything similar to this previously, it was unsure of the next steps.

The Industrial Digitalisation Team at the VEC worked closely with Rawwater to gain a good understanding of its current operations, issues and concerns. A detailed overview of what was required, ensuring minimal environmental impact, was then considered.

The VEC ran numerous multi-physics simulations for multiple design options for Rawwater's M3 low melting point alloys, with several changeable variables. These included temperature petametres, operational speeds, fluid dynamics and dimensions to best determine the most effective and ideal solution.
As test variables could be quickly and easily altered to create hundreds of results, Rawwater was able to assess a number of results and recommendations based on datasets. Features observed in the simulations were confirmed as seen in experimentation, thus providing confidence in the results.

THE BENEFITS

Rawwater is confident that this digital solution will enable its team to accelerate the design process with precision and accuracy. After only one week of running simulations, the company was assured that its casting processes were being accurately represented.

"The simulations created and ran by the CW4.0 team at the Virtual Engineering Centre have not only helped to upskill our current team in technologies such as modelling, but also given us the confidence to explore integration of digital solutions as part of our design process. This support has streamlined the process for us and has made our goals significantly more achievable, knowing that our unique process can be accurately simulated."
- Kat Lennox, Managing Director, Rawwater Applied Technology Ltd

Rawwater is now exploring the ways in which it can best implement this technology moving forward. Knowledge transfer with the Virtual Engineering Centre has also equipped the company to explore alternative solutions to future issues and efficiencies.