

MADE SMARTER

Impression Technologies is meeting data demand to ensure future success

Impression Technologies (ITL), an innovative advanced aluminium light weighting technology business in Coventry, is confident of further impressing new and current customers after receiving support from West Midlands Made Smarter.

Established in 2012, ITL is renowned for developing Hot Form Quench (HFQ®) technology, which delivers complex aluminium parts and maximises strength whilst reducing weight.

From its headquarters at Lyons Park, ITL provides design, prototypes, and production for its customers in automotive, aerospace and consumer markets, including Aston Martin and Lotus.

The 50-strong workforce currently generates about £1 million annually from:

- i) research and design contracts,
- ii) production of over 70,000 ppa for the automotive market, and
- iii) licensing revenues.

The Made Smarter West Midlands programme has led to Impression Technologies funding over £50,000, to add to a £20,000 grant from the initiative, to invest in a system which will improve their data analysis.

By increasing capacity to generate powerful and advanced insights on HFQ® technology, ITL will enable the business to be more data-driven and attract new contracts.

Tiago Teixeira, senior process engineer at Impression Technologies, said: "I think we will see multiple benefits from being involved in the Made Smarter project.

"The new data collection system will change how we analyse our process data to provide better insights on process improvement of ITL production line. However, this will become a standardised

way of data collection across the different licensees."

The Challenge

HFQ® enables weight reduction by 20-50% in transport sectors through downgauging and part count reduction, but still maintaining the strength requirements thanks to the use of ultra-high strength aluminium alloys.

Low-volume orders are manufactured on-site in Coventry, but higher volumes are manufactured by partners in the UK, Germany and China.

Impression Technologies wanted to improve the process data collection at their facilities by automating data collection and implementing a traceability system. This will allow them to record process history data for each part produced in a centralised platform. Automating the way data is collected and analysed will also allow them to push the technology forward for the commercialisation of future products.

The business is seeing increased demand for data from Original Equipment Manufacturers (OEMs), while full traceability and complete thermal history of the parts are required for aerospace standards.

After attending a webinar about the Made Smarter West Midlands programme, the business initially contacted WMG, at the University of Warwick, and then Paul Sullivan, Digital Transformation Specialist at Made Smarter, got in contact to explain in full detail

how the initiative could help the business with its plans.

Tiago said: "One of the key benefits of HFQ® is the manufacturing of complex, lightweight solutions that enables competition in areas where, traditionally, steel has been used.

"Previously, we had data collection systems for certain equipment but they didn't interact with each other and it relied heavily on human interaction. We want to provide higher value services by increasing our data and connectivity skills."

Paul organised for Nasar Jockey and Daniel Peavoy from WMG centre High Value Manufacturing Catapult at the University of Warwick, one of Made Smarter's strategic partners, to visit Impression Technologies' premises to put together a 'digital roadmap'.

Onur Eren, of WMG, University of Warwick, said: "We're delighted to have helped Impression Technologies with their digitalisation journey. By investing in digitalising their business, they will not only become more competitive but increase their sustainability too.

"We know how stretched for time SME manufacturers are, so by having their data all in the right place, it can save so much time and stress later down the line. Impression Technologies has demonstrated how forward-thinking they are by taking part in this project."

The Solution

The 'digital roadmap' looked at various options before concluding that installing part marking and barcode readers are key steps in the HFQ® process. These solutions, integrated with a new PLC unit, enables data collection from multiple machines.

Paul worked with the business to complete an application form to successfully secure a maximum grant of £20,000 towards the system.

Paul said: "There are many fantastic benefits for businesses

who take part in the Made Smarter programme including the opportunity to apply for a £20,000 maximum grant.

"This can be a game-changer to SMEs particularly in the current economic climate because we often find that businesses have innovative ideas but just need an extra financial hand to decide to go ahead and implement them."

Tiago explained: "It means we can integrate machines together and develop analytics to create further business.

"At ITL, we do a great deal of research on production data, and having access to already standardised data will allow us to be the market leader.

"It means we can accelerate information and having improved, quality data means we can apply it to other projects such as aerospace.

"There is an industry demand to provide quality data and traceability of our products.

"It will give us opportunities to deliver improvements for future commercial projects by increasing our efficiency and pushing forward our understanding of the technology."

The Benefits

Tiago said there was now full integration between all the machines from a data perspective and the installation of the 2D code scanners had not caused any disruption.

"From the beginning, we wanted to combine the foundations of the way we work with being able to extract the data efficiently," he said.

"Previously, press data was not automatically linked to part ID and needed to be manually downloaded with no connection between the production cell and our servers, limiting part traceability.

"We found that collecting process data alongside inspection sheets for analysis was time and resource consuming, but that has all changed now.

"The data from our presses, furnace and robot are linked to the serial number of each part which enables reliable and real-time process monitoring.

"Automating our data for analysis has meant we have been able to focus on advancing our analytics as well as gaining process insights, only possible thanks to the online traceability system.

The Future

Tiago said he wanted to generate value for Impression Technologies through the data now being collected.

He said: "In the future, I want to expand our data analytics and process monitoring system to other processes in the business.

"At the moment, it is just based at the critical aspects of HFQ® but by expanding it to other parts of the processes (i.e. incoming material), we will be able to work on more projects, which will lead to new contracts.

"I would encourage other businesses to take part in Made Smarter because their help with the application form, along with 'roadmap' support by WMG, was incredibly helpful. Smart manufacturing is new to a lot of people in the industry and we couldn't have delivered this project without the support of WMG.

"WMG helped guide us through the process by putting our vision into measurable goals and supporting ITL with seeking funding, which was essential, due to the small size of our business.

"Accessing these funds has allowed us to make rapid progress in data analytics, process monitoring, and part traceability. Without the Made Smarter funding, it would have taken a significant amount of time to fund this project with internal resources only. Thanks to this, we have the means to be more competitive."

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Tiago Teixeira from Impression Technologies (left) with Onur Eren, of WMG, University of Warwick.

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CASE STUDY