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High Value Manufacturing news
Issue 06

CATAPULT
High Value Manufacturing

HVM CONNECT



In the Spotlight: The
Manufacturing Technology Centre

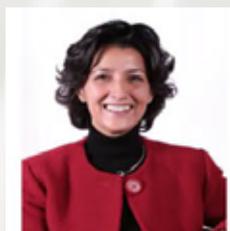
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Working with
Innovate UK

CATAPULT
High Value Manufacturing

WELCOME TO HVM CONNECT

Your bi-monthly high value
manufacturing update



Rosa Wilkinson
HVM Catapult
Communications
Director

Like it or loathe it, our world is changing. New digital technologies are transforming the way we interact with each other, the way we travel and the way we make things. In just a short space of time our daily lives will begin to look very different – robotics will relieve us of dull, menial or dangerous tasks, the scope for human error will be cut back thanks to autonomous equipment, sensor technologies will give us a flow of data that will mean we can spot problems before they happen, decision-making will be empowered by access to more and better quality data.

Some, I know, see ghouls in these new technologies, fearing they will kill jobs and expose us to risk. The reality, I think, is very different. Yes, our work environment will change as will the roles within it, but – as with every new technological breakthrough – my guess is that the net result for employment will be positive. The bigger risk, for me, is that we fail to harness the benefits these technologies offer while our competitors apply them leaving the UK perplexed on the side-lines.

Thank goodness, then, for the HVM Catapult's Centres. As the articles in this edition of HVM Connect show, technologists across our network are throwing their expert lassos around these tools of our fourth industrial revolution to keep us fit for an increasingly global competition. They are to be saluted.

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www.hvm.catapult.org.uk

HVM Catapult Centres work on aerospace world-first



Picture: The autonomously controlled Phoenix long endurance aircraft

Three HVM Catapult Centres, the Manufacturing Technology Centre, the National Composites Centre and CPI, are playing a major role in a ground-breaking project to develop the world's first unmanned variable buoyancy-powered ultra-long endurance aircraft.

The autonomously-controlled Phoenix aircraft has undergone successful test flights and has the potential to take the lead in the world development of pseudo-satellites.

Pseudo-satellites are able to fly, remotely-controlled or autonomously, at very high altitudes for long periods of time - often months. They can fly above commercial aircraft routes and above turbulence and moisture. They complement conventional satellites and can be used for earth-mapping, scientific observation and intelligence gathering.

The 15 metre-long Phoenix spends half its time as a heavier-than-air aeroplane and the other as a lighter-than-air helium balloon. The repeated transition between these two states provides its sole source of propulsion.

Phoenix has been developed by a consortium of industrial partners, universities and members of the High Value Manufacturing Catapult. From the Catapult centres there were the MTC's advanced production systems group, the National Composites Centre and the Centre for Process Innovation. University partners included the University of Bristol, Newcastle University and the University of the Highlands and Islands. Industrial partners were Banks Sails, Stirling Dynamics, IQE and TCS Micropumps.

[Click here to read more.](#)

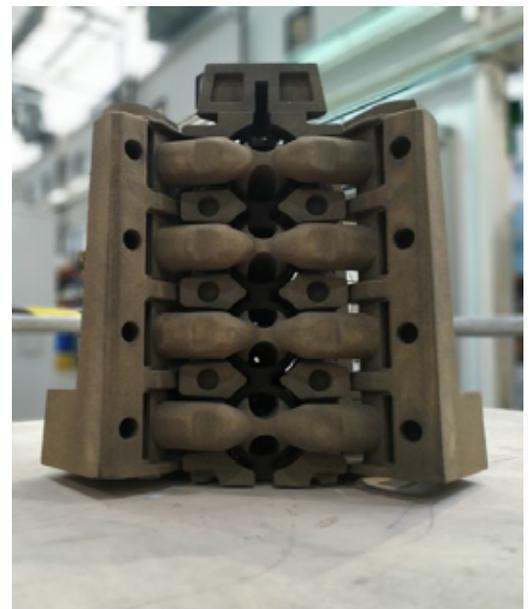
AMRC Castings enhance 3D sand printing capability

In an expansion of its current capabilities, the AMRC castings group has become one of the first foundries to take advantage of large-scale 3D sand printing technology.

Capable of producing complex moulds and cores for oil, gas, aerospace and automotive without the need for dedicated tooling, the technology has been exploited for R&D, pre-production and full-scale production volumes at the University of Sheffield Advanced Manufacturing Research Centre (AMRC).

AMRC Castings, which is part of the AMRC and is based on the Advanced Manufacturing Park near Sheffield, now has two of the additive manufacturing machines for the printing of one-piece 3D sand moulds and complex cores that would ordinarily require significant capital investment in pattern equipment and multiple core-boxes to be made and assembled.

[Click here to read more](#)



Research furthers initiative that could divert 100,000 tonnes of waste ash from landfill each year

Heat treatment experts at the University of Strathclyde's Advanced Forming Research Centre (AFRC) have furthered research into a sustainable initiative that could save up to 100,000 tonnes of waste ash from landfill each year.

The project commissioned by Enva, formerly William Tracey Group and funded by Construction Scotland Innovation Centre (CSIC), saw heat treatment methods used to diminish contaminants from ash to produce high quality concrete pellets for the construction industry.

Enva collects ash from waste and biomass plants, most of which goes to landfill as waste. The recycling and resource management company investigated the possibility of turning the waste stream into a construction product with both commercial and quality benefits.

Experts at the AFRC carried out various furnace trials to determine the most suitable time and temperature required to produce a reliable concrete product made from waste ash, cement and water. The mix was then made into small pellets.

A non-contact infrared thermometer monitored temperature uniformity across the batch of pellets throughout the heat treatment process and provided additional information on the optimum temperature required.

The trials confirmed that the pellets were potentially environmentally friendly and highlighted that the refined quality of the ash component increased the strength of the product.

[Click here to read more](#)



MTC robotics experts help revolution in farming



Engineers and scientists from the Manufacturing Technology Centre have worked with the Hampshire-based Small Robot Company to develop a new generation of agricultural technology which will bring the power and precision of robots to farming, potentially replacing tractors for many jobs.

The small digitally-controlled robots are able to plant, feed and weed arable crops autonomously with minimum waste. They are able to plant seeds, apply fertiliser and herbicides, and weed crops with precision. The farmbots improve the way food is produced, minimising chemical use, making farms more profitable while increasing yield and efficiency.

Prototypes of the robots have been produced and are carrying out field trials on 20 farms across the UK including the Waitrose Leckford Estate Farm and the National Trust's Wimpole Estate. Funding for the project has come from Innovate UK and the MTC, boosted by £1.2 million in crowd-funding.

Jeremy Hadall, chief engineer for intelligent automation at the MTC, said the technology had the potential to make significant improvements in farm productivity and profitability.

"We are delighted to be working with the Small Robot Company, developing the company's precision drilling and planting robot, which has the potential to improve yields, and therefore profits, while substantially reducing the use of chemicals. The technology harnesses manufacturing advances used in traditional manufacturing industries and allows exceptional accuracy, while creating a map showing the location of each seed," he said.

"With growing populations and increasing challenges in farming, using ideas and technologies from other sectors will bring about real innovation and transform the way we feed ourselves in the future," he added.

[Click here to read more](#)

WMG partners with Triumph Motorcycles in electric motorcycle project

Triumph Motorcycles has announced a new collaboration with UK industry experts, academic leaders including WMG at the University of Warwick, and Innovate UK, to develop specialist electric motorcycle technology which will provide significant input into potential future electric motorcycle offers from Triumph. This two-year project (TRIUMPH TE-1) also includes partnership work with Williams Advanced Engineering, and Integral Powertrain Ltd.

This new collaboration will combine Triumph's globally-renowned motorcycle expertise with advanced automotive-based capabilities to generate technological innovation for future electric motorcycles.

"This new collaboration represents an exciting opportunity for Triumph and its partners to be leaders in the technology that will enable the electrification of motorcycles, which is driven by customers striving to reduce their environmental impact, combined with the desire for more economical transportation, and changing legislation," said Nick Bloor, Triumph CEO. "Project Triumph TE-1 is one part of our electric motorcycle strategy, focused on delivering what riders want and expect from their Triumph, which is the perfect balance of handling, performance and usability."

A unique collaboration between industry experts, academic leaders and Innovate UK.

[Click here to read more](#)



Join us for the UK Manufacturing Forum: Building the Pathway

Monday 8th July

IET London: Savoy Place

16:00- 20:00

The second UK Manufacturing Forum event in December 2018 brought together leading academics, alongside senior figures from industry and government to share important updates and develop roadmaps in collaboration with the research and innovation community. Working together to drive collaboration forward, the High Value Manufacturing Catapult and Institute for Manufacturing explored emerging trends and opportunities for collaboration across the national manufacturing ecosystem and focused on four technology forum areas including:

- Digital
- Metrology
- Additive
- Composites

Join us for the interim UKMF event at the IET London: Savoy Place on 8th July to hear about progress made since the last meeting as well as future plans for strategy development. There will be updates from UKRI, HVM Catapult and IFM, with an opportunity to explore further collaborative engagement activities, map priorities and chart our next steps, as well as networking with colleagues and peers in the concluding drinks reception.

Hear from Professor Sam Turner, Chief Technology Officer of the High Value Manufacturing Catapult and Professor Tim Minshall, Head of the Institute for Manufacturing, on the progress made since the last UK Manufacturing Forum in the areas of Digital Manufacturing, Metrology, Additive Manufacturing and Composites Manufacturing and how we can work together to pull through the additional technologies that will underpin a sustainable high value manufacturing future for the UK, exploring the importance of academic collaboration in developing both technology and strategy roadmaps over the next twelve months.

[To reserve your place, please register now via our EventBrite page here.](#)

The deadline for registration is 24th June 2019.

HVM Catapult and IFM (UK Manufacturing Professors Forum)

Save the date: The next annual UK Manufacturing Forum: from research to UK success will be held on 9th & 10th December at the Slate Conference Centre, University of Warwick, CV4 7SH

In the Spotlight: The Manufacturing Technology Centre



Embarking on the journey from traditional manufacturing to advanced digital manufacturing is a daunting prospect for any company. For small and medium sized manufacturing businesses it can be, at best, confusing, at worst, frightening.

But since its establishment in 2010, the Manufacturing Technology Centre's teams of manufacturing and engineering experts have worked with hundreds of companies to smooth the path of digital transformation, from increasing awareness to delivering full blown solutions in collaboration with technology vendors. They have introduced businesses to appropriate and innovative manufacturing processes and technologies in an agile, de-risked environment.

The MTC works with companies at every level; from helping senior managers and executives decide which is the right technology to invest in, to ensuring that apprentices get the right training to fill the manufacturing jobs of the future.

The MTC has taken the lead in encouraging the adoption of smart, digital manufacturing in UK factories. For the last four years, it has hosted its sell-out Digitalising Manufacturing conference, a key event in the manufacturing calendar which brings together the world's

experts on the fourth industrial revolution and translates that expertise into practical steps that companies can take to improve their businesses through technology. The fifth conference of the series - Digitalising Manufacturing 2019 - takes place on November 4 and 5 and will focus on making digital manufacturing a reality. It will include the MTC Digital Experience - one of the largest exhibitions of its kind demonstrating digital manufacturing in smart, connected factories and versatile and capable supply chains.

While the conference is a major once-a-year event, MTC technologists are working with companies on a daily basis to help them introduce technology into their factories, which will help them flourish. A tool to help this process is the "Factory in a Box" developed by the MTC, the University of Birmingham, Loughborough University and a team of industrial partners. The "Factory in a Box" is a modular, remotely-controlled, rapidly deployable demonstrator showcasing how advanced industrial technologies can benefit manufacturers and their supply chains, speeding up their route to market and taking advantage of new business models. The Factory in a Box is also an example of digital architectures and solutions that can drive future factories.





The MTC also has a Manufacturing Support Services operation to help SMEs improve productivity and competitiveness by embracing new technology and advanced processes. The team has worked with more than 500 SMEs and at any one time has more than 150 live projects. This activity includes the Digital Transformation team, who have helped companies including the Coventry-based precision engineering company Harris RCS, who have made double-digit productivity gains along with big advances in production planning and on-time schedules by replacing manual set-up processes with a digital solution.

The MTC's ability to help companies make big strides by introducing advanced technologies is helped by the fact that the MTC itself is a leader in the development and application of many of these technologies. A good example of this is additive manufacturing, or 3D printing, which is one of the fastest growing areas of advanced manufacturing.

The National Centre for Additive Manufacturing (NCAM) is housed at the MTC, and it brings together the most comprehensive combination of equipment and capability in the UK. The MTC is also home to the European Space Agency's Additive Manufacturing Benchmarking Centre, and is working with other international organisations to develop additive manufacturing applications further.

The £15 million Digital Reconfigurable Additive

Manufacturing for Aerospace (DRAMA) programme is led by the MTC and is aimed at encouraging suppliers to the UK aerospace industry to adopt additive manufacturing, which is increasingly being demanded by the country's prime aerospace manufacturers. The DRAMA team at the MTC is developing a Digital Learning Factory where the entire additive manufacturing process chain can be digitally twinned, enabling process development to be simulated in a virtual environment before transfer to physical machines. The factory is also an exemplar in shop-floor connectivity that enables the full potential of digital technologies. This digitally smart process can reduce costs and de-risks the deployment of additive manufacturing.

The MTC is also a leader in the application of intelligent automation and robotics, working with companies to apply digital technology to a wide range of sectors including food and agriculture. The MTC is recognised as a leader in the fields of virtual and augmented reality, in particular the ergonomic aspects of factory and machinery layout and process simulation. Laying virtual images onto real-world scenarios allows the simulation of complex processes and operations, demonstrating how people interact with machines. MTC technicians are working with SMEs, using this technology remotely. It effectively gives those SMEs their own visualisation laboratory connected to a remote expert who they can access on demand.

In addition, the MTC has recently launched a national initiative “Artificial Intelligence Hub in Manufacturing”, which is a collaborative ecosystem to generate foresight and increase uptake of AI in manufacturing. This Hub will provide a platform to help UK industry understand and demonstrate the future need for AI as a service for manufacturing.

Techniques and processes developed for manufacturing can be applied to a wide range of sectors. Construction is a sector which has traditionally been resistant to technological advance, struggling to improve productivity and slow to adopt new technology or invest in research and development. All this despite being one of the largest sectors in the UK economy with a turnover of £370 billion and employing more than three million people.

The MTC is playing a key role in the Construction Innovation Hub which brings together the world-class construction sector expertise of the MTC, BRE (Building Research Establishment) and the University of Cambridge's Centre for Digital Built Britain (CDBB). With funding from UK Research and Innovation's Industrial Strategy Challenge Fund, the Construction Innovation Hub is a national focal point for the promotion, research and development of new digital and manufacturing technologies for the construction industry to create high-performing buildings and infrastructure with strong levels of safety, quality and energy performance.

Of course the digital factory revolution isn't just about new machines or software. It's also about people with the skills to drive technological transformation. The world's major manufacturing companies need a digitally-enabled supply chain staffed by employees who have the technological skills and knowledge to support an end-to-end digital strategy - a talent pool of people prepared for the changes that technology brings. This is where the Advanced Manufacturing Training Centre (AMTC) on the MTC campus comes in.

Supported by £10 million of funding from Lloyds Banking Group, the AMTC will have supported more than 3,500 manufacturing apprentices, graduates and engineers by 2024, equipping them not just with basic engineering disciplines, but also the right skills to be at the forefront of manufacturing in the future. The AMTC is creating a new generation of engineers and technicians, equipped with the advanced manufacturing skills of the future.

This is all part of the MTC's digital strategy; bringing a manufacturing eco-system together that embraces skills, disruptive processes, innovative technology and thought leadership, which combine to fulfil the MTC's stated aim of inspiring Great British manufacturing on the global stage.

www.the-mtc.org





SGL Carbon enters into partnership with the National Composites Centre

The UK's National Composites Centre (NCC) and SGL Carbon have entered into a new partnership to jointly develop future composite technologies for different applications in aerospace, transportation, as well as oil & gas. A development area is the improvement of material utilization for primary and secondary structure components.

To this end, the two partners are currently setting up a development program for the advanced processing of carbon fiber-based textiles like Non-Crimp Fabrics (NCF) at the NCC's research and technology facility in Bristol. Over the course of this year, they will produce demonstrator components and prototypes of new composite airplane wings using NCF materials based on carbon fibers from SGL Carbon. The fabrics are developed for efficient processing of composite components and are produced at the SGL Carbon site in Wackersdorf, Germany. The carbon fibers used are being produced by SGL Carbon in their UK manufacturing site at Muir of Ord, in the Scottish Highlands and their Moses Lake site in the US.

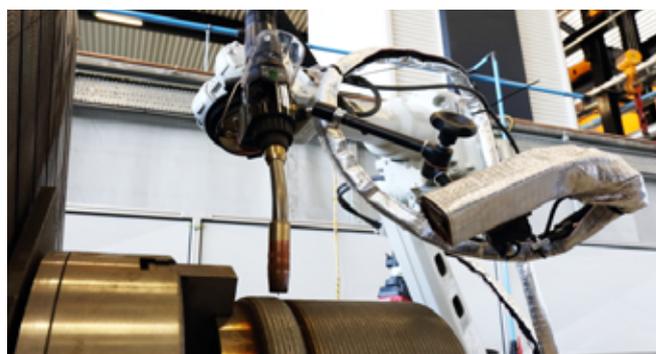
Richard Oldfield, CEO of the National Composites Centre: "We are delighted that SGL Carbon has joined the NCC's rapidly growing innovation network. We share a commitment to technical excellence and a bold vision for the potential future applications of carbon fiber technology. We are looking forward to welcoming the SGL Carbon team to our Bristol technology centre to start, what we believe will be, a series of successful and ground-breaking innovation programs." [Click here to read more](#)

New robot cell focuses on innovative welding

Nuclear AMRC welding engineers are using a new robotic welding cell to investigate an arc technique which promises to cut cycle time while reducing the risk of distortion.

Cold metal transfer is a new kind of gas metal arc welding (GMAW) which can join and clad with much lower heat input than conventional methods. Standard MAG techniques usually require a continuous feed of wire into the weld pool, creating a continuous arc which rapidly builds up heat.

The trick lies in the welding head, developed by Fronius, which moves the wire backwards and forwards several times a second, breaking the arc as soon as it forms. Allowing the weld to cool between each drop reduces the risk of component distortion. The technique can also eliminate spatter, reducing the need for post-weld clean-up or providing a high-quality clad finish.



The team have now completed initial cladding trials using CMT, and are now working on capability development projects alongside commercial research projects for nuclear and oil & gas applications.

The researchers will use the cell to develop automated welding techniques for high-volume products such as decommissioning waste containers. Other welding technologies, including plasma and keyhole TIG, will be added to the cell to provide a comprehensive suite of automated arc capabilities.

[Click here to read more](#)

CPI collaborates on cutting-edge testing facility to advance formulated liquid manufacturing

Working alongside the Universities of Birmingham, Leeds and Edinburgh, CPI has created an open-access facility to enhance SME and larger corporate partners' liquid product development. Formulated products typically comprise a large number of component ingredients, and while industry developments have provided the ability to create more optimised and controlled manufacturing processes, implementation remains challenging owing to cost restraints.

CPI's fully digitally-enabled test bed will address this issue, offering partners a time-saving, cost-effective research tool by de-risking innovation through rapid learning and analysis of new, complex liquid processes and technologies prior to capital investment. Users will be able to learn quickly and efficiently across scales, ultimately enabling manufacturing processes that deliver product attributes that are scalable, sustainable and economical. It will allow companies to understand and control the dynamics of scale-up and scale-down within batch formulation processes and serve as a test bed for novel sensors and process analytical tools.

The equipment will be housed at the University of Birmingham between April and December this year. It will then be moved to CPI to complement their existing formulation capabilities at Sedgefield, and be operational from March 2020 onwards.

Graeme Cruickshank, Director of Formulation at CPI, said: "We are delighted to have worked on this novel infrastructure, which will provide SME and larger corporate partners with greater scope to carry out development of next generation products..."

It is a real cost-effective, time-saving tool that will ensure the UK's formulated products manufacturing sector remains at the vanguard of innovation."

[Click here to read more](#)



MTC appointed lead auditor for UK Robotics



The Coventry-based Manufacturing Technology Centre has been appointed a lead auditor by the British Automation and Robot Association – the trade body which aims to promote the use of robotics in British Industry.

The MTC will have lead responsibility for auditing UK robot integrators seeking certification from BARA, and engineers from across the High Value Manufacturing Catapult centres will be available to support the scheme. The audit will ensure that UK companies are qualified to integrate robotics into a production line. Certification will demonstrate that they have appropriate skills and procedures following a rigorous audit and on-site checks.

Jeremy Hadall, chief engineer for intelligent automation at the MTC said the appointment was an important step in growing the capability and capacity of UK robotic integrators.

"Over the past decade there has been a three-fold increase in the number of robots sold in the UK, with some analysts predicting that the global market for industrial robots could become a £30 billion industry by 2025. This has prompted the need for an industry benchmark to evaluate integrators' technical knowledge and safety practices," he said.

He added, "As things currently stand, anyone can claim to provide systems integration services but that doesn't necessarily mean they are trained or competent to integrate a robot into a production line. The new audit system will offer end-users peace of mind that the company and integrator they have appointed to carry out the work has been independently verified."

[Click here to read more](#)

Make UK Manufacturing Awards 2019

The High Value Manufacturing Catapult is sponsoring the Make UK Manufacturing Awards' Business Innovation award this year – this award celebrates innovations executed through new products, processes, markets and business models. Such innovations will be governed by strategic intent and have driven greater productivity, efficiency and or business growth, within the last three years.

Entry is now open for the Make UK Manufacturing Awards – the deadline to enter is the 1st July 2019.

Share your success stories and be part of the UK's biggest celebration of manufacturing.

Judged by a panel of independent industry experts, the Make UK Manufacturing Awards are the most credible of their kind, recognising manufacturing businesses and their talented people.

[Click here to find out more and enter](#)



The AFRC partners up with Matsuura to accelerate the use of innovative machine tool technology across Scottish firms

The University of Strathclyde's Advanced Forming Research Centre (AFRC) has agreed a tier one partnership with Matsuura Machinery Limited, aiming to accelerate the use of innovative machine tool technologies that can save significant costs across sectors such as aerospace and oil and gas.

As a core feature of this partnership, Matsuura will provide support in kind, supplying its MX-520 5-axis Computer Numerical Control (CNC) machining centre, which will widen the scope of what the AFRC can do for customers using different materials across a number of industries.

Matsuura's state of the art CNC technology will allow the AFRC to develop processes using difficult to machine alloys, resulting in productivity increases across research projects that offer real-world industry applications and significant cost benefits.

Working closely with the AFRC's machining and additive team, Matsuura will enhance its growing presence in Scotland while gaining access to the centre's vast network, which includes global manufacturers and growing local businesses.

The AFRC has received the latest version of Matsuura's industry-leading MX-520 5-axis CNC machining centre, their fastest selling machine in their UK history. The MX-520 is primarily aimed at companies making the transition from 3 to 5-axis operations, although established customers for their automated and unmanned 5 axis products have also invested heavily in this platform.

Stephen Fitzpatrick, Manufacturing and Additive Team Lead at the AFRC, said: "We are delighted to bring Matsuura on as a tier one partner and look forward to collaborating with them on innovative CNC focused projects.."

[Click here to read more](#)



Current Innovate UK funding opportunities

Innovate UK Smart Grants

Competition opens: 26th April 2019

Competition Closes: 24 July 2019

Opportunity to apply for a share of up to £25 million to deliver ambitious or disruptive R&D innovations with significant potential for impact on the UK economy.

[Click here to find out more and apply](#)

Innovate UK

Event: Nuclear Innovation Conference

The Nuclear AMRC and NNL present a major conference covering research supported by the government-funded Nuclear Innovation Programme.

Join the Nuclear AMRC, National Nuclear Laboratory and international industry experts in nuclear, digital manufacturing and R&D to discover the research so far, and learn more about the opportunities to come.

[Click here to find out more](#)

**NUCLEAR
INNOVATION UK
CONFERENCE**
R&D FOR THE NEXT GENERATION

The HVM Catapult has a wealth of quantitative and qualitative data on the impact it is having on the companies we work with. Our case studies give a good impression of the value we have added to many companies across all sizes and all sectors. Maybe we could help your business? There is a cost involved, but we can signpost sources of funding, for example, through Innovate UK. Email us at info@hvm.catapult.org.uk if you'd like more information or to discuss working with us.

Small heat exchangers present big welding challenge



NUCLEAR AMRC



The Nuclear AMRC has worked with heat exchanger specialist Thornhill Group to demonstrate a new welding method for small tube-to-tubesheet assemblies which could have cycle time.

The project called on the Nuclear AMRC's powerful disk laser welding cell, more often used on large components of up to three metre diameter. Using the laser on tubes measuring just 8mm diameter presented numerous challenges to the centre's engineers, who successfully demonstrated that large-capacity welding machines can be used for nuclear components of all sizes.

One of Thornhill's customers in the nuclear sector was looking to implement a tube-to-tubesheet joint within a restricted space, and asked the company to investigate how this could be designed and manufactured. To complement their own expertise in heat exchanger development and fabrication, the Thornhill team called on the Nuclear AMRC to help determine the feasibility of the customer's design.

The study for Thornhill was one of the first commercial projects for the Nuclear AMRC's disk laser welding cell, which was commissioned in early 2018. The cell was designed to develop high-speed welding techniques for large assemblies such as 3m³ nuclear waste containers, but is also capable of very fine narrow welds thanks to the high power density of the laser beam and fast travel speed of its gantry-mounted robot.

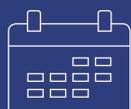
"Thornhill's heat exchanger was

much smaller than the assemblies we usually work with, and right at the limit of what our robot and welding head can handle," says Dr Will Kyffin, head of the Nuclear AMRC's welding team. "The size and inertial mass of the robot meant that programming it to perform an accurate circumferential weld of just 8mm diameter was extremely challenging, especially as this was a new facility and the team were still finding out what it could really do."

The welding head had to be customised for the job, with the large gas nozzle and shield removed in favour of a separate gas shielding nozzle, and laser power was reduced to just 2kW from its maximum 16kW. Ensuring a high quality weld meant considering a host of factors, from angle and position of the weld head, to reducing the gas flow to avoid turbulence in the molten metal.

Initial trials showed that small tube-to-tubesheet welds could be successfully completed, with welding taking just over one second for each join. Allowing for movement time, a full tubesheet could be welded in a matter of minutes.

The project proved that a robotic laser welding cell can successfully join small tube-to-tubesheet assemblies, and the customer's design can be manufactured to requirements.



Dates for your diary

Low Carbon Vehicle Event 2019

4th - 5th September 2019

Millbrook, Bedfordshire

The UK's Premier Low Carbon Vehicle Event

Come and see us in hall 3 at LCV 2019. Cenex LCV is the UK's low carbon vehicle event incorporating four key features: The UK's Premier Low Carbon Vehicle Event, Technology exhibition split over three halls; Extensive seminar programme; Facilitated networking with the low carbon community; Ride & drive of the latest research & development and commercially available vehicles.

[Click here to find out more](#)

Digitalising Manufacturing 2019

4th - 5th November 2019

MTC, Coventry

After a sell-out conference in 2018, the MTC is delighted to announce the dates for Digitalising Manufacturing Conference 2019. Join the MTC on the 4th & 5th November for their fifth annual conference and gain the know-how you need from worldwide leading experts.

[Click here to find out more](#)

Smart Factory Expo

13th - 14th November 2019

Liverpool

Come and see the HVM Catapult at this year's Smart Factory Expo. The event brings together expertise, ideas and opportunity - the UK's showcase for digital manufacturing.

[Click here to find out more](#)

WORK WITH US

The High Value Manufacturing (HVM) Catapult is here to help UK businesses of all sizes accelerate new concepts to commercial reality.

Working through seven world-class centres of industrial innovation, we provide access to the specialist equipment and expertise you need to help investigate new technologies and processes and test their application. We can also help you to improve existing processes. We're here to help you strip away the risks of innovation and make investment decisions when you are confident that an idea can be scaled up to deliver on a commercial scale.

Our services are available to firms of all shapes and sizes, from FTSE-listed companies to SMEs deep in the supply chain. They include:

- Capability which spans from basic raw materials through to high integrity product assembly processes
- World-class facilities and skills to scale-up and prove high value manufacturing processes
- A network of leading suppliers who contribute to key UK industry supply chains
- A partnership between industry, government and research in a shared goal to make the UK an attractive place to invest in manufacturing

Our ambition is to grow your business and the contribution of the manufacturing sector to the UK economy.



For more information or to discuss working with the HVM Catapult, please contact:

Email: info@hvm.catapult.org.uk

Telephone: +44 (0) 1564 711 540

HVM Catapult
Regus Building
Blythe Valley Park
Shirley
Solihull
B90 8AG