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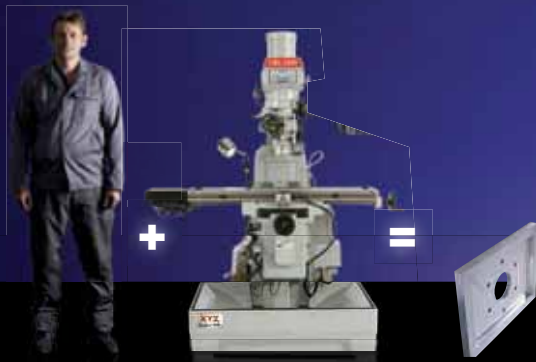
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MAY/JUNE 2023 - Features:

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| ■ 5-Axis Machining | ■ Waterjet Machining |
| ■ Cutting Tools | ■ Press Brakes |
| ■ Measurement & Inspection | ■ Sawing & Cutting Off |

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Kitagawa extends workholding options to prismatic machining

Japanese-manufactured Kitagawa rotary workholding systems that are usually fitted to lathes are now being offered for highly efficient static workholding on the table of machining centres. In the UK and Ireland, sole agent for these YS Modular Systems is 1st Machine Tool Accessories, Salisbury.

The pneumatically or hydraulically operated static cylinders have multiple workholding options for pull or push chuck actuation and are rapid to set up for various production requirements. Cylinders with a standard mounting interface can be supplied to actuate 6-inch, 8-inch or 10-inch chuck sizes.



Kitagawa rotary workholding systems for lathes are being offered for efficient workholding on machining centre tables. In the UK and Ireland, sole agent for these YS Modular Systems is 1st MTA

Base units may be mounted side by side, depending on machine size, to facilitate multiple workpiece fixturing and automated production. Pull force is up to 20.8 kN with pneumatic actuation or 51.9 kN with low pressure hydraulic actuation at 15 bar, with up to 20 mm of piston stroke.

Multiple standard workholding options are available including three-jaw power chucks for holding prismatic workpieces, collet chucks for round, square and hex billet up to 80 mm and expanding mandrels with a pull-back function for internal gripping of components with bores from 12 up to 82 mm diameter as standard.

The low profile of the cylinders, down to just 77.5 mm in height for the 6-inch model, does not unduly restrict Z-axis motion, maximising the prismatic milling and drilling envelope of the machines on which they are mounted. A screw-on protective cover allows unused units to remain permanently on the machine table, if desired, without fear of damage due to swarf ingress from machining at an adjacent fixture.



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British Steel to become leader in machining of special profiles

Forming part of a £26 million investment by British Steel's owner Jingye Group in the Skinningrove steelworks near Redcar, a travelling-column machining centre with a working envelope of 14,000 mm x 4,100 mm x 1,600 mm is currently being built in Germany by SHW Werkzeugmaschinen. It will be delivered to Skinningrove towards the end of 2023, where it will be set up as a turnkey installation by Kingsbury, the machine manufacturer's sole agent in the UK, Ireland and GCC.

Despite being of such large capacity, the Uniforce 4000 5-axis machine will nevertheless be able to hold extremely tight tolerance on special rolled steel profiles produced in the mill. The combination of size and accuracy will set the company's machining capability apart from that of all other global players.

Included in the current spending round are expansion of the Skinningrove site, plus the purchase of four new CNC lathes for turning mill rolls, three bandsawing cells for cutting stock to length, a laser measurement system for process control of every bar rolled and a warehousing system for storing and retrieving raw and processed material. Previous significant investments involved the installation of an advanced surface descaling system and robotic identification tracking of each profile manufactured.

The rationale for the latest project is a legacy situation within British Steel that for the last 20 years has seen special profiles produced in Skinningrove transferred by truck 35 miles west to the machine shop in the group's Darlington facility for processing. The resulting bottleneck limited throughput of the company's special steel profiles and delayed their just-in-time delivery to world markets. The vast majority of product is used in Europe, North and South America, India and Asia.

The bottleneck will soon be history, as all processing will be done on the Skinningrove site and the Darlington facility will be closed. The optimisation of operations will save not only time but also the cost and vehicle emissions associated with the constant transport of material by road. It is predicted



that the new processing facility will add a further 30,000 tonnes of output within the next two years. It will thereafter see a further substantial increase when material handling in the new plant becomes fully automated.

David Waine, commercial director for Special Profiles at British Steel Skinningrove, comments: "We are delighted that this biggest single investment in British Steel Special Profiles for more than 30 years will further strengthen our global presence and service offering.

"The new service centre here will incorporate one of the finest large-capacity machine shops in the world, turning us into the number one manufacturer globally of value-added machined special profiles, rolled to precise customer requirements.

"The first target market will be masts for forklift trucks, especially high-reach models. However, the milling machine will have the capability to enhance our offering across all sectors."

Simon Burrow, business development director for Large Prismatic Machines (LPM) at Kingsbury advises: "The 14-metre X-axis of the Uniforce 4000 in build for British Steel will have a three-metre table at one end for processing smaller parts transferred from the Darlington mill, enabling offline setup and pendulum machining.

"5-axis prismatic milling and drilling capability is provided throughout the machine volume by a 2-axis universal head that allows the horizontal-spindle machine to execute vertical-spindle operations at the smaller table.

"Another aspect of the installation is the phased investment, which will enable loading of extrusions to be automated to increase capacity in the future as market share and production volumes increase."

Dominic Hill, British Steel's technical manager, Special Profiles, adds: "We opted for this large milling solution from Kingsbury rather than those offered by other potential suppliers due to the high build quality of the German machine, as well as certain design features that are unique in this size range.

"One is counterbalancing of the head driven by twin ballscrews to compensate mechanically for droop, whereas the other OEMs offered less effective software compensation. The other significant plus point is the use of box guideways rather than linear guideways, which translates into higher rigidity, productivity and machining accuracy."

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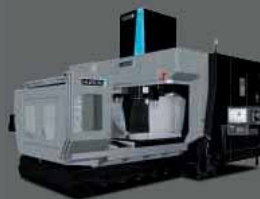
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New entry-level 5-axis machining centre

At the recent DMG MORI Open House held at the machine tool manufacturer's Pfronten factory in Germany, a new 5-axis machining centre was launched aimed at the entry-level market. Less than two metres wide, the compact, competitively priced DMU 40 is capable of fully interpolative 5-axis machining to within microns within a 550 x 450 x 420 mm working volume.

Of trunnion-mounted rotary table design, the machine is based on the DMU 50 3rd Generation, of which more than 10,000 have been sold worldwide and features best-in-class components as well as preparation for automated production.

The one-piece machine bed made from grey cast iron, optimised geometry of the Y- and Z-axis slideways and the inline spindle with hydraulic clamping all ensure high rigidity. Direct-drive ballscrews in the X and Y axes improve surface quality. For machining flexibility, the swivel range of the B-axis extends from -35° to 110°.

The ergonomic design of the DMU 40 offers optimal accessibility to the work area. Table loading height is 800 mm and the distance from the operator to the table centre is short, while it is also possible to load components by crane. A large window and improved lighting provide good visibility. Optionally, the tool magazine may be loaded from the front.

There are three machine options with different equipment packages to meet customers' individual requirements. The standard DMU 40 has a 12,000 rpm spindle and 24-position tool magazine. DMU 40 PLUS features a 15,000 rpm spindle and a tool magazine with 30 pockets, linear scales and passive cooling of all main components. DMU 40 PRO is the most accurate and productive model,



with active cooling and a 20,000 rpm spindle.

The machine may optionally be fitted with automation in the form of a PH 150 pallet handling system or Robo2Go Milling robotic handling of workpieces, allowing customers to take advantage of autonomous production including overnight and at weekends.

Machine tending for larger lathes

Occupying a footprint of only 12.5 sq metres, the new Robo2Go MAX from DMG MORI allows large lathes and turn-mill centres to be easily and flexibly automated. The robotic system is designed for handling workpieces from 40 mm to 400 mm in diameter and weighing up to 115 kg, maximum

payload including gripper being 210 kg.

The design of the Robo2Go MAX is based on a 6-axis industrial robot housed in a safety enclosure that also contains a workpiece storage module. In the basic version, it can be loaded and unloaded quickly with two Euro pallets via a roller shutter door, either by forklift truck or by a DMG

MORI driverless PH-AGV automated guided vehicle. Alternatively, workpieces may be wheeled in and out on trolleys.

A proven vision system is available to detect the position of raw material and finished parts on the pallets. The system offers space for additional options such as alignment and turnover stations, which means that even the most complex workpieces can be produced autonomously.

A modular gripper offers maximum flexibility in terms of the diversity of components that can be handled. Regardless of the Robo2Go MAX configuration, the control system and tool magazine of the respective turning centre remain freely accessible.

As with the smaller Robo2Go Turning, no robot programming knowledge is required to set up and operate the larger system. For



uniform control of Robo2Go variants, DMG MORI has developed its own app that enables the creation of a production process based on predefined program blocks. The app has a multi-job function to allow placement of different components on one pallet or tray, ideal for producing small and medium batch sizes.

The specification of the Robo2Go MAX makes it capable of automating DMG MORI turning centres from the CLX 750 and CTX beta 2000, through the CTX beta 1250/2000 TC and entire CTX gamma TC series, up to some sizes of lathe in the NLX and NTX ranges.

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Longevity of lathes prompts repeat purchases

It is often said that a subcontractor does not know what type of work will be coming through the door the next day and therefore needs versatile machine tools to be able to produce a wide variety of components. The diversity of work is particularly large in the case of contract machinists Repro Engineering, 80 percent of whose turnover derives from turn-milling, components being mainly in the diameter range 19 to 51 mm. Throughput in a variety of different plastics typically accounts for one-third of the total, but at times is as much as 50 percent, the remainder being mainly mild and stainless steels.

The mainstay for production of a large proportion of the turned parts are CNC turning centres from Citizen Machinery, both Miyano fixed-head lathes and Cincom sliding-head models. The first Miyano to be installed was a BND42S twin-spindle lathe with live tooling. It arrived in 1997 and departed just three years ago after 23 years of service, having produced more than 2 million components, most in one hit and a large proportion in lights-out operation. The second Miyano, a BND51S, was bought in

1998 and sold in mid-2022 after an even longer period on the shop floor.

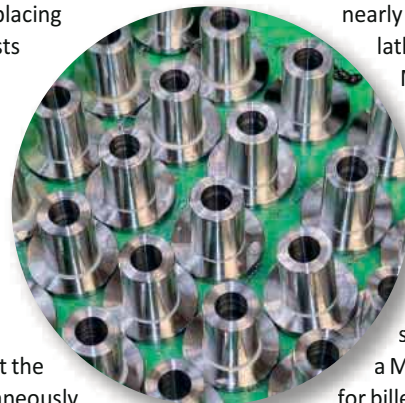
Repro Engineering's owner and managing director Richard Palmer says: "We have a policy of regularly reviewing our capacity and keeping the plant up to date. In the case of the Miyanos, however, earlier exchange simply wasn't necessary, as the machines continued to hold tolerance. Not having to spend money on replacing them earlier helps to keep costs down for our customers and makes us more competitive."

The replacement for the BND51S was a more capable BNJ-51SY, which arrived in May 2022. Featuring two turrets and Y-axis movement of the main turret, the lathe allows complex machining operations to be carried out at the main and sub spindles simultaneously. The turning centre also sports many more tool positions than the older model, so fewer



tool changes are needed. It is normally possible to put the next part up without any cutter exchange at all.

Nine Miyano machines have been purchased over the years and many have been replaced by newer models. The subcontractor's current tally of bar-fed lathes of this make is five, accounting for nearly half of its fixed-head lathes. Three of the



Miyanos have a Y-axis function and all are fitted with short bar magazines for feeding one-metre stock up to 51 mm diameter.

Additionally, the subcontractor operates a Miyano LZ-01R chucker for billet work, especially components that need hard turning.

Regarding Repro Engineering's sliding-head capacity, the subcontractor operates three Cincom lathes capable of machining parts from up to 32 mm diameter bar. There are also five smaller capacity sliders of a different make on site. Impressed with the quality and longevity of the Miyano machines, Richard Palmer decided to approach Citizen for larger Swiss-type lathes capable of producing bigger diameter, often shaft-type components. He purchased a Cincom A32-VII in 2009, followed by a more highly specified M32-VIII with a B-axis in 2013, and another A32-VII two years later.

All were bought before the Japanese lathe manufacturer had introduced its novel Low Frequency Vibration (LVF) chip breaking software, otherwise Richard Palmer would definitely have specified it. The programmable function, which breaks stringy swarf into short chips, is ideal for turning plastics and stainless steel efficiently. Instead, Richard Palmer relies conventionally on high-pressure oil to promote chip breaking and prevent bird's nesting.

Extensive use is made of Citizen's Alkart Wizard CNC programming software to



prepare programs for both the Miyano and Cincom lathes. It guides operators through the creation of part programs, calling on a built-in code library and reference diagrams to optimise machining of different materials. It cuts down the amount of time spent typing in G and M codes, or consulting manuals and validates the program before it is run.

Repro Engineering also

operates four machining centres, which generate the other 20 percent of turnover. One machine is part of an automated cell with robot loading and some are equipped with a fourth CNC axis, but for indexing, not turning. It means that all components produced that require both turning and milling go onto the lathes.

Richard Palmer points out that, in this respect, a twin-spindle bar-fed turning centre is the ideal platform for unattended production in one hit of complex components, even prismatic parts requiring all six sides to be accessed. Cycle times tend to be longer on mill-turn centres, which in



any case normally require an operator to be present. He does not hesitate to put onto his lathes parts that require no turning operations at all except parting-off.

Richard Palmer concludes: "All Citizen lathes are real workhorses. They are robust, compact and some have hand-scraped guideways, which leads to excellent machining quality.

"The Miyanos in particular are so heavily built, they are almost over-engineered. They just keep going and going, maintaining their accuracy and repeatability for decades. Consequently for machining parts up to 51 mm, they are our preferred lathes.

"Likewise, for turning and milling in sliding-head mode, we have standardised on Cincom when machining parts from larger diameter bars up to 32 mm."

Founded by Richard Palmer's father Davin in 1967 and now operating 24/7 from a 12,000 sq ft premises in Waterlooville, Hampshire, Repro Engineering produces batch sizes typically in the range 1,000 to 50,000, although prototype batches down to 100 are not infrequent. Some parts are machined to very tight tolerances down to 10 microns total.



Customers are mainly in the motorsport, defence, sports and leisure, electronics, medical and fluid power sectors and many take advantage of the subcontractor's consignment stocking service. The company is accredited to ISO9001:2015 and AS9100 Rev D, ensuring high quality standards. In addition, it is registered on the International Aerospace Quality Group's OASIS (Online Aerospace Supplier Information System) database.

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Like all machine tools manufactured by Victor, build quality and rigidity are assured with the Victor Vcenter G-series line-up. The powerhouse 3-axis G-series is available in three size variants to meet the diverse demands of the industry. Unlike its competitors in the mid-sized VMC market segment, the G-series incorporates a meehanite casting with a wide base A-Frame design, a wide span column, four boxways and screw removers with a wide boxway. All of these factors take performance and stability beyond the realms of other machines in its class.

The three G-series variants include the G105, G135 and G165. The smaller G105 provides X-, Y- and Z-axis travel of 1,050 by 600 by 600 mm and this stretches to a spacious 1.650 by 850 by 900 mm on the largest G165. This exceptional freedom of movement is matched by the accommodating bed sizes of 1,100 by 600 mm (G105), 1,400 by 700 mm (G135) and 1,700 by 800 mm (G165). Furthermore, the robust nature of the range permits the loading of components up to 1,200, 2,200 and 2,500 kg respectively for the three machines.

Common features on all three machines include a powerful gearhead spindle design that generates a power output of 18.5kW with an impressive torque level of 498Nm. Developed, manufactured and built in-house by Victor, the 6,000 rpm gearhead design spindle retains maximum torque levels throughout the speed range. This makes the Vcenter series the perfect choice for machining hard materials and exotic alloys with material removal rates that far exceed that of any other machine in its class. Adding to this, the G-series incorporates a BIG-PLUS BBT-50 spindle taper that guarantees dual face and taper spindle contact for industry

leading precision, repeatability and performance. This power and stability enhance precision levels with a platform that also generates surface finishes and industry-leading component quality.

The Victor Vcenter has an automatic tool change unit with 24 tool capacity and the option for 32 or 40 tool positions; all positions can accommodate tools up to 15 kg. The axis feed motor generates 3 kW of power on all axes with a rapid feed rate of 20 m/min and axis acceleration of 0.28G, which is driven through extremely large 50 mm diameter ballscrews to further enhance stability.

As standard, the Victor Vcenter G-series is supplied with the latest FANUC Oi-MF Plus CNC control unit, fully enclosed splash guarding, spindle oil cooler, screw-type chip removal, bottom guarding for coolant flushing, rigid tapping, three step warning lights, auto power off and levelling pads.

Like every Victor machine that is available from GM CNC, the Vcenter G-series is available with a host of options to meet the exact requirements of the end user. Options include a 4th and 5th axis interface for increased flexibility, 32 or 40 tool ATC, probing for automatic tool and component measuring. Additional options include through spindle coolant, chip conveyor with cart, air conditioning for the electrical cabinets and linear scales for enhanced precision levels. Customers can also select a table shower, oil skimmer, automatic doors, air and coolant guns and much more.

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Milling and grinding of large components in one setup

German machining centre manufacturer Roeders has introduced a new production centre, the RXU 2000, for manufacturing large components requiring a high degree of precision. The 3-axis machine is intended not only for 3D milling but also for jig, vertical or profile grinding. Availability in the UK and Ireland is through sole sales agent Hurco Europe.

The machine has been designed for high performance when cutting hardened materials and has a working volume of 2,000 x 1,800 x 800 mm. The Z-axis travel has been intentionally limited to ensure maximum accuracy. Both the Y and Z axes feature the machine builder's rigid, robust Quadroguide design, while the massive machine bed is very effective at damping vibrations. Maximum table load is five tonnes.

The combination of milling and grinding in a single setup on the same platform is particularly well suited to mould and tool making and to producing high accuracy parts for machine building. Linear drives in all axes as well as an advanced temperature management system for the entire machine



The new Roeders RXU 2000 milling and grinding centre from Hurco Europe

ensure the highest levels of precision, even during long machining runs. Dimensional accuracy to within five microns, and roundness of one to two microns depending on bore size, can be achieved throughout the machining envelope.

A 22,000 rpm, 101 Nm, HSK-A63 spindle is available for high metal removal rates. Alternatively, spindles up to 80,000 rpm may be supplied for different applications. On request, the machining centre can be configured as a double-spindle machine, for



Gear grinding on the RXU 2000

example with a high-precision air bearing spindle alongside the main spindle.

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Dugard turns up productivity with fixed and sliding head lathes

Companies with the heritage of AW Engineering Ltd are very rare. Founded in 1908 by Alfred Wood, the subcontractor switched its workload to munitions and aircraft parts during World War II and, ever since, the company has remained under the stewardship of the same family.

In 2020, almost 101 years to the day being at the company's previous property, it moved to a new 15,000sq/ft factory in West Molesey. In the two years since the move, the company has doubled its turnover under the leadership of Mark Felstead; the great, great grandson of company founder Alfred. Contributing to this growth is the investment in three machine tools from Dugard.

The plant list did include four VMCs, two twin-spindle twin turret mill/turn centres, four sliding head turning centres and a range of ancillary equipment. However, the company has rapidly added to this with two SMEC SL2000BSY twin-spindle single turret turning centres, a Hanwha HCR5 Cobot and a Hanwha XD38 IIRNHY sliding head turning centre. Commenting on the rapid growth and the installation of three machine tools from Dugard in quick succession, current owner and managing director Mark Felstead says: "As a general subcontract manufacturer, we do everything from small to long series batch runs, turnkey applications to customer contracts and even projects that require a complete family of parts for assembly. We often produce batches in the tens and 20s, but frequently produce batches from 3,000 to 5,000 and even long series runs up to 50,000 or 60,000-off."

Manufacturing simple to complex components for industry sectors as varied as agricultural, architectural, electrical, medical, PPE and the lighting industry from all types of materials, AW Engineering is in a fortunate position to have long-term customers and contracts. However, this is credited to a reputation built over decades and a propensity to always serve the customer. So, when a long-term customer was having trouble with quality from other suppliers, it approached AW Engineering with a large order that needed mill/turn capacity. With an order book bulging at the seams, the Surrey company stepped up regardless.

Mark Felstead says: "Our twin spindle

mill/turn centres were already working around the clock, so we needed a new machine to fulfil the order. During Covid, suitable machine tool supply was sparse. We spoke with Dugard and within two weeks of placing an order for a SMEC SL2000BSY, the machine was on our shop floor and running. With furlough and other restrictions during the pandemic, Dugard was the only company that could serve our needs."

Installed in April 2021, the SMEC SL2000BSY hit the floor running and has been running almost 24/7 since installation.

Less than six months after the installation of the first machine, AW Engineering placed an order for a second SMEC SL2000BSY. As Mark Felstead recalls: "As a result of the first machine working so well, we went and ordered a second. Fulfilling the first contract for a customer in the electrical industry, we won a second long-term contract. The confidence the customer had in our ability to deliver high-quality components from the SMEC machine led them to us on another project, a family of six parts. Initially manufactured by an alternative supplier, the client was having issues with precision, surface finishes and defects from its supply chain."

The issue for AW Engineering's customers in the electrical industry was that parts had to be machined to an impeccable standard with uncompromising surface finishes and a concentricity and parallelism tolerance of +/-0.02 mm on most features and also both faces of the mill/turned parts. Unfortunately, this level of precision resulted in defects.

With a combination of aluminium and stainless steel components with cycle times of up to seven minutes on some parts, the SMEC has been running the components for several weeks on what is projected to be a long-term contract. Both SMEC machines have bar feeds and a 65 mm diameter bore that is perfect for 24/7 production. As a company that only runs a single shift with



Two Dugard SMEC turning centres in action at AW Engineering



The Dugard SMEC SL2000SY at AW Engineering

some overtime, many of the machines on the shop floor are running around the clock unmanned. The two SMEC machines are manned by a single operator. However, some components in the family of parts are above the 65 mm diameter bar feed threshold and require manual loading.

Here, AW Engineering has purchased a Hanwha HCR5 Cobot from Dugard.

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Okuma announces green credentials

Machine tool manufacturer Okuma has announced that, since October 2022, production in its three main factories in Japan has used only carbon-neutrally generated electricity, a goal that was achieved earlier than expected. The firm's machining centres, CNC lathes and grinders are sold in the UK and Ireland through sole agent NCMT.

In a further announcement, Okuma says that from April this year it will be labelling certain of its products Green-Smart Machines if they have been shown to cut energy usage considerably. The company claims that three technologies developed in-house particularly assist in energy efficiency when its machine tools are in operation.

One is the proven Thermo-Friendly Concept applied to both the machine structure and spindle, which uses feedback from temperature sensors to deliver high accuracy machining in a normal shop floor environment, without the need for a warm-up period. This saves not only power but also money and raises production output.

ECO Suite plus provides autonomous energy saving by monitoring spindle

temperature and, when it is stable, automatically turning off the coolers. It also monitors hydraulic demand and activates the pump only when necessary, while auxiliary equipment runs when required and stops automatically. A display on the machine shows exactly how much energy is being saved.

The other power minimisation technology is Okuma's systems for spindle cooling, which it says reduce energy consumption by as much as 68 percent due to optimised control.

A video describing these and other energy-saving measures from Okuma is available at: www.okuma.co.jp/english/green-technology/index.html

NCMT has been distributing and supporting world-class machine tools since its creation in 1964. Its highly trained technical staff will help you get into production quickly by providing your



One of Okuma's machine tools destined to be a Green-Smart Machine

employees with the support and training they need to ensure the smooth installation and operation of the equipment.

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Hexagon and Stratasy's unlock 3D printed PEKK's lightweighting potential for aerospace engineers with simulation

Hexagon's Manufacturing Intelligence division and Stratasy's, leaders in polymer 3D printing solutions, have applied Hexagon's simulation technology to capture the behaviour of Stratasy's high-performance, ultra-lightweight Antero™ reinforced polyetherketoneketone (PEKK) materials and its additive manufacturing processes. These rigorously validated simulations offer Stratasy's customers unique insight so they can lightweight components and introduce new sustainable aircraft and spacecraft faster.

3D printed plastic parts offer transformative lightweighting for aerospace, reducing the energy use and increasing the range of new aircraft. When the material and processes are fully exploited by product designers, it may also reduce the cost caused by over-engineering and the waste and lead times of traditional manufacturing. However, the adoption of plastics and additive methods for structural components has remained slow due to the industry's safety-critical nature and regulations. Providing engineering teams the simulation tools to validate that these materials will achieve the required part performance when manufactured is the "missing link", enabling designers to apply these breakthroughs today.

Rigorously validated multi-scale models of these new high-performance aerospace approved materials, Stratasy's Antero 840CN03 and Antero 800NA, have now been added to Hexagon's Digimat materials exchange ecosystem, with associated print process parameters from Stratasy's aerospace-ready 3D printers. Using these detailed proprietary models, engineers can create digital twins that accurately predict how parts printed with the chosen material and approved aerospace-ready Stratasy's printer will perform in a digital reality with real-world use cases and certification tests before any physical prototypes are manufactured.

Developed to be open, Digimat software gives manufacturers the ability to design lighter parts that can match metals in performance and avoid costly overengineering using their preferred Finite Element Analysis (FEA) and Computer-Aided



Engineering (CAE) tools. Moreover, companies that use Digimat in conjunction with Hexagon's MSC Nastran and MSC Apex will accelerate the certification and documentation of their work.

The Antero™ materials are already being used at the cutting edge of aerospace engineering, bringing major innovations to reality on time, such as Lockheed Martin using Antero 840CN03 to create NASA's Orion spacecraft docking hatch cover. By making rigorous digital engineering and virtual manufacturing possible with these new simulation tools, more product development teams can apply and de-risk Stratasy's aerospace additive manufacturing solutions.

Aziz Tahiri, vice president of global aerospace and defence for Hexagon's Manufacturing Intelligence division, says: "As the aerospace industry continues to push for more sustainable designs, unlocking the lightweighting potential of thermoplastics and 3D printing will be key. By leveraging the power of our simulation technology, manufacturers gain access to proprietary information so their engineers can 'work the problem' with reliable information. We're excited to see how this next chapter with Stratasy will help the industry create lighter, stronger designs in any design engineering tool with more confidence and less cost and help bring next-gen aircraft to market faster."

Foster Ferguson, aerospace business segment leader for Stratasy, says: "The Antero 840CN03 and Antero 800NA thermoplastics provide unprecedented strength, heat and chemical resistance. When combined with Hexagon's simulation insights and actionable data, these 3D printed materials' ability to replace certain applications of aluminium and steel clearly points to growing use in the aerospace

industry. We believe they meet manufacturers' increasingly complex performance needs and, by combining innovative modelling software with 3D printing, can reduce production timelines from months to days."

The Antero 840CN03 material is a PEKK-based thermoplastic for Fused Deposition Modelling (FDM®) additive manufacturing that combines the physical and mechanical qualities of PEKK with carbon nanotubes for consistent Electrostatic Dissipative (ESD) properties. The high-performance polymer exhibits exceptional chemical and wear resistance, ultra-low outgassing properties.

The Antero 800NA material is a PEKK-based FDM thermoplastic with mechanical properties that include high strength, high heat resistance, toughness and wear-resistance. These qualities make it a lighter alternative to aluminium and steel in certain use cases. Chemical resistance and minimal outgassing provide suitability for aerospace applications where prototypes and parts are exposed to jet fuel, oil and hydraulic fluid. Other uses include industrial applications where high strength and chemical resistance are needed.

Through the partnership between Stratasy and Hexagon, which has spanned more than a decade, several high-performance thermoplastic materials have been characterised and added to Hexagon's Digimat material modelling software.

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Quaser helps aerospace motor manufacturer take off

As a company that specialises in providing innovative electro-mechanical solutions to the aerospace and defence sectors, NEMA Ltd is at the cutting edge of technology. Specialists in transforming concepts into an achievable reality, Rochdale-based NEMA work with virtually all of the UK's leading aerospace OEMs as well as being integral in collaborative research projects. To work at this end of the industry, the company invests in machine tools from the Engineering Technology Group (ETG).

Founded in 1954, AS: 9100 certified NEMA has a rich tradition of being at the forefront of technology, working with the aerospace, defence, marine and high voltage switchgear sectors since its inception. The company acquired its first ETG turning centres back in 2018 and this has been followed by 3D printing technology, a Mitsubishi EDM and most recently a Quaser MV184 CNC machining centre with a Nikken 4th axis rotary system.

As a company that holds customer approvals from household names like BAE Systems, GE Aviation, Martin Baker, Westland, Collins Aerospace and Airbus UK to



name a few, NEMA is intent on retaining its high-quality levels and exceeding customer expectations. This is why it works with ETG.

Commenting upon the relationship with ETG, NEMA managing director Andy Wilding says: "We have worked with ETG for several years and they always have the solution we

require. The staff are friendly, supportive and always available and we have a great relationship but, most importantly, the technology is fantastic. We have bought machines across virtually every technology discipline from ETG and all our workholding and toolholding requirements are also fulfilled by ETG Group company Hyfore Workholding. They supply all our collets, vices, lathe chucks and even the VDI tooling for our turning centres."

Andy Wilding continues: "We have a machining centre that is now approaching 20 years old and whilst it still performs brilliantly, we want to reduce our reliance on an older machine that is susceptible to increased maintenance and downtime than a newer machine especially as we win more new work. Additionally, a lot of our milling work revolves around the design, development and manufacture of electric motors for the next generation of 'electrified' aircraft. As the motor units evolve to generate more power, they subsequently increase in size and our 400 by 800 mm bed on the existing machining centre was too small for many of the new parts coming through our door. As well as a swelling order book that demands more machining capacity, these are two key reasons why we bought the 3-axis Quaser MV184 VMC with a Nikken fourth-axis rotary unit."

The Quaser MV184 provides 1,200 by



600 mm bed with a working range of 1,020 by 610 by 610 in the X, Y and Z axes. This easily supports the increasing dimensions of the work coming through the door at NEMA. Another factor that swung the purchasing decision in favour of the Quaser MV184 was the Heidenhain TNC620 CNC. As Andy Wilding adds: "We have a range of technologies and CNC controls on the shop floor, but the Heidenhain is by far our most preferred CNC. It is an extremely flexible unit and we can conduct online and off-line programming with the Heidenhain. As it is the preferred platform for our shop floor, it simplifies the integration of the MV184 machine into our business. The majority of our work is prototypes, one-offs and small batches, so flexibility is critical to our business and the Heidenhain gives us this flexibility."

Looking closer at the benefits of the Quaser MV184, Andy Wilding adds: "The components we machine are primarily precision aluminium and stainless steel parts with some complex machining, which is why we added the Nikken 4th axis rotary unit to our order. The machine has only just been installed, but in the first few weeks, we can see that it is faster, more powerful and more efficient than our existing machining centres.

We produce housing components regularly for Martin Baker aircraft seats and since moving a regular batch of 20 to 30-off components from the older machine to the Quaser, we have noticed some measurable differences."

As the regular batch of up to 30 parts is considered a 'long-runner' for NEMA, the company can evaluate the performance of the latest acquisition against its predecessor. With the robust build quality and a powerful 15/18.5 kW 12,000 rpm BT40 spindle that combines with a host of other features such as the through spindle coolant, linear encoders, thermal compensation system, spindle nose thermal compensation unit and a 30 position ATC, the performance of the Quaser MV184 far exceeds its predecessor.

Andy Wilding concludes: "On the Martin Baker parts, the Quaser has improved productivity by more than 20 percent compared to the previous machine, but this is just one benefit. The Quaser also has a greater distance from spindle nose to the bed, so we can use longer tools for reaching cavities and other difficult features on jobs.

"The machine is not only faster, the build quality has created a more stable platform and this is giving us improved tool life, surface



finishes and process reliability. The machine has only been here a few weeks and we are delighted with the difference it is making on our shop floor with regards to overall performance and productivity. No doubt, the longer we have the machine and the more familiar our staff become with its capabilities, we will be able to identify and qualify even greater benefits."

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Starrag's Heckert machining centre combines with Nikken toolholders for high-performance AMRC aerospace projects

Tripartite collaboration between project enabler/integrator, machine tool supplier and toolholding specialist is continually pushing the boundaries of high-performance machining and increasingly reducing machining lead times and production costs for a major aerospace company.

The ongoing work between the project lead, the University of Sheffield Advanced Manufacturing Research Centre (AMRC) and machine tool specialist Starrag UK, plus the tooling expertise of Nikken Kosakusho on a variety of aluminium and titanium aerostructure workpieces is cutting piece part costs through the creation of improved machining routines.

"Although not directly targeted by the projects, in some cases reductions in cycle times are one rewarding by-product of the work, in some cases of more than 50 percent compared with 'conventional' machining processes," says Starrag UK's director for sales and applications, Lee Scott.

Tom McCready, engineering and operations manager at the AMRC's Machining Group, adds: "By setting new benchmarks in the way in which we use the full capabilities of the machine and tooling packages, we are consistently gaining new ground in the way parts are being machined. As some of these projects involve 'live' production workpieces, the gains achieved at being more effective and efficient in machining are already being transferred into the manufacturing processes."

The AMRC houses an array of state-of-the-art manufacturing equipment to enable partner companies and project sponsors to develop and trial new technologies and processes. It works closely with customers and project sponsors to select the ideal machines and manufacturing technologies required to fulfil each project's individual demands.

Initiated by the AMRC's Machining Group with two of its Tier 2 partners, Starrag UK and tooling integrator, Nikken, Starrag's Heckert X40 horizontal machining centre has been moved a few hundred yards from its initial AMRC Factory of the Future base on Sheffield's Advanced Manufacturing Park to Nikken's Innovation Centre for Europe.



Engineers from the AMRC team are continually working with Nikken and Starrag to utilise the impressive capabilities of the 5-axis machine and its tooling packages.

The Heckert X40's high-performance features include impressive rigidity and damping, based on established and renowned build principles, complemented by rapid traverse rates of 80 m/min and a 20,000 revs/min spindle that offers torque values up to 350 Nm.

Among Nikken's world-class toolholding solutions is the Slim Chuck, a high-accuracy collet chuck that boasts minimal runout, three microns at four times diameter, leading to higher component precision and improved tool life. Also, its maximum gripping torque is more than double that of traditional ER alternatives. This not only complements the Heckert X40's rigidity/stability to permit



more aggressive machining parameters, but also improves process security and therefore leads to reduced scrap.

The workpieces, of titanium and aluminium, all fit within the machining envelope of 700 mm by 750 mm by 750 mm in X, Y and Z axes.

Tom McCready adds: "With all three partners collaborating closely, we have so far collectively achieved some incredibly successful results by pushing the limits of the machine and the tooling for increased metal

removal, without jeopardising quality on these workpieces.

“Importantly, we closely monitor and record the resulting performance data in real time relative to NC code line via digital enabling/connectivity through a Siemens Edge device. The machine incorporates Starrag’s Human-Machine Interface (HMI) for easier, intuitive programming and operation including factors like machining forces and spindle temperatures.

“We interpret this data and, if necessary, adjust the processes to suit and ultimately arrive at an improved NC code to achieve consistently repeatable process improvements by setting new machining benchmarks.”

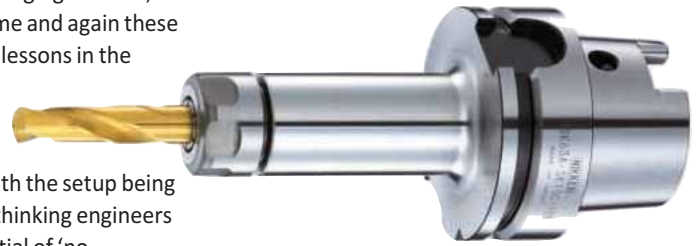
Lee Scott comments: “This is another example of the success of Starrag’s long-term relationship with AMRC and Nikken and, in this case, it highlights how an affordable machine, one that combines all the best attributes of its predecessors but in a compact footprint and at a cost-effective price, can produce real time savings and cost benefits on a variety of workpieces for companies of every size.”

Nikken’s deputy managing director, Nathan Ray, adds: “Time and again these projects are providing lessons in the rewards of marrying a high-performance machine with world-class tooling, with the setup being operated by forward-thinking engineers to fulfil the true potential of ‘no compromise’ machining.”

Since 2003 Starrag has progressively installed eight machines at the AMRC and at sister centre, the Nuclear AMRC, as part of its AMRC membership.

High-precision machine tools for greater productivity

Starrag Group is a leader in manufacturing high-precision machine tools for milling, turning, boring and grinding workpieces of metallic, composite and ceramic materials. Principle customers are internationally active companies in the aerospace, energy, transportation and industrial sectors. In addition to its portfolio of machine tools, Starrag Group provides integrated technology and maintenance services that



significantly enhance customer quality and productivity.

The umbrella brand Starrag unites the product ranges Berthiez, Bumotec, Dörries, Droop+Rein, Ecospeed, Heckert, Scharmann, SIP, Starrag, TTL and WMW.

Headquartered in Rorschach/Switzerland, the Starrag Group operates manufacturing plants in Switzerland, Germany, France, the UK and India and has established a network of sales and services subsidiaries in the most important customer countries.

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Its high stability and good service life make rhenus TY 155 L a machine-friendly all-rounder. The clear MWF not only has excellent foam degradation but is also water-soluble and represents a particularly compelling option for materials that are prone to staining, such as aluminium alloys. These special properties allow it to reduce material costs and shorten machining processes.

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In the development of rhenus TY 155 L, importance was specifically attached to compatibility with humans and the

environment. The MWF features good skin compatibility with a neutral pH value and also impresses with its pleasant odour. This user-friendly and multitalented product is declared as being in water hazard class 1 and is GHS label-free. rhenus TY 155 L contains no boron and is an excellent choice for people and nature alike.

Dr Hans-Jürgen Schindwein, head of product management MWF at Rhenus Lub says: "With rhenus TY 155 L, we've developed a mineral oil-free metalworking fluid that also meets the requirements of special, hard-to-machine materials and light alloys that are prone to staining."

rhenus TY 155 L special metalworking fluid at a glance:

- Mineral oil-free
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- Suitable for the following machining methods: drilling, turning, milling, reaming, scalping, sawing, thread cutting and forming, deep drilling, surface and cylindrical grinding

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As an innovation leader, Rhenus Lub invests an above-average amount in research and development, with over 20 percent of all employees working in this area. Through its subsidiary companies and other representative partners abroad, Rhenus Lub has a presence in over 30 countries around the world.

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Image below: For the semiconductor industry, the metalworking fluid rhenus TY 155 has already been awarded a process approval



Wogaard coolant and oil savers are vital for efficiency at Techno Group

When you are running a big operation, you want every aspect of that operation to run as efficiently as possible. Wogaard is committed to helping companies achieve the levels of efficiency they crave through its ingenious coolant oil saving solutions.

On a recent visit to Technoset in Rugby, a key business for Techno Group, Wogaard managing director Jason Hutt witnessed the impressive array of machines the company had assembled within their facility.

He was shown around by Adam Land, the operations director at Technoset, who proudly described the machines, which include sliding head lathes from Tornos, Star and, a recent investment, Citizen M32 with LFV. Sitting on the opposite side of this neatly organised factory is a bank of larger fixed-head lathes including Miyano BNJ42, ABX64 and further technology in multi-axis milling machining centres.



“Our machines are top-class, but so are the machining processes and all the elements that go into them from the tooling to cutting oils,” explains Adam Land. “We recognise that the cutting oils play a massive part in the process, so when you make that investment, you don’t want it in the bottom of the swarf bin. You want to get it back out and back into the machine, and that’s where the oil savers and coolant savers work exceptionally well for us.”



He continues: “In my previous experiences, I learnt a lot about metalworking fluids and their impact on the process. One of the key features of controlling concentration is controlling the level of coolant in the machine. So, if we allow 20-30 litres of coolant across a 24-36-hour shift to accumulate in a bin that could be 10 percent of our coolant capacity out of the bottom of the machine. If you allow your levels to drop and your evaporation to increase, then concentration increases and then what you drag out is even more concentrated and even more expensive. So, it’s really important to keep coolant levels up.

Adam Land concludes: “As we move out of the pandemic, we’re looking to expand our operating hours. For a while, we’ve only operated during a single shift in the daytime, but we’re now pushing to improve our lead times by bringing in a second shift in the evening to get as much as we can out of the machines. With this extra demand for efficiency, we don’t want alarms popping up and stopping production, so it’s really important that the oil and coolant savers are in the bottom of the bin getting that coolant back into the machine.”

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New investment in Mitsubishi EDM turns business around

Founded almost 40 years ago, Travelling Wire Ltd was a business that needed updating until Richard Weller bought the company just over six years ago. Despite its impressive reputation for servicing the toolmaking industry in the South East, a lack of investment was sending the business into steady decline. However, the change of ownership has brought a completely new lease of life to the company and it has invested heavily, especially in Mitsubishi spark and wire EDM machines from the Engineering Technology Group (ETG).

The company had a raft of ageing technology that included three Mitsubishi FX10 and one FX20 wire erosion machine as well as other EDM machines in the 25 to 30-year-old age bracket. As the new owner of the Burgess Hill business, Richard Weller, a technical manager at another toolmaking business, swept in and began to invest in new technology. The results have been nothing short of amazing.

With a dilapidated plant list, Richard Weller started to have a clear out by removing the ageing technology and replacing it with new. As the company owner and managing director says: "When I bought the business, the immediate issue was that all our wire and spark erosion machines needed constant attention. The wire would break multiple



Managing director Richard Weller of Travelling Wire

times each day on every wire EDM machine, meaning the shop floor staff would have to re-thread the wire and re-start the job from the start of the program. Likewise, the spark erosion machines could only spark one hole or feature at a time and operators would have to re-set the machine for the next operation. Added to this, the old machines would constantly need maintenance and

'running repairs' to keep them going. We needed to do something and rapidly."

The Mitsubishi solution

In his previous business, Richard Weller had decades of experience with Mitsubishi EDM machines so he immediately called upon Scott Elsmere, the resident EDM expert at ETG. Following the departure of some of the FX machines, Travelling Wire was left with an outdated Mitsubishi FX20 good BA8 machine running alongside a machine from another vendor. The business was struggling to meet its customer commitments. Following a conversation with Scott Elsmere, the subcontract manufacturer purchased a Mitsubishi BA24 wire EDM in 2019.

Richard Weller explains: "The difference to our old technology was amazing. If I was to describe our old machines, I would say it was like having a car where 'the handbrake doesn't work' or you are 'running without lights', there was always an issue that created inefficiencies. The BA24 had automatic wire re-threading and this instantly enabled us to run our wire EDM unmanned overnight. The machine we replaced needed wire re-threading constantly and, while this only took 5 minutes, it meant we always had to be watching the machine. The BA24 was saving 20-30 minutes a day in re-threading time



The Mitsubishi MV2400R and SG12S

alone. Add in the 50 percent productivity increase as well as the unmanned night running, the difference was huge. We erode a lot of tungsten carbide and one job that took 24 hours to process unmanned on the BA24 would have been a minimum of three days on an older machine.”

From 2018 to 2022, the company continued to invest, acquiring a new CNC milling machine, a new manual mill, CMM, a large surface grinder and a rumbling machine for deburring parts. One factor that made a difference was the commitment to becoming ISO: 9001 certified. Richard Weller says: “Historically, the company had been servicing toolmaking businesses and general subcontract manufacturers. ISO: 9001 won us business with new customers and simultaneously, the Mitsubishi BA24 improved our productivity and quality to meet the demands of our growing customer base.”

While the Mitsubishi BA24 and BA8 was an improvement upon previous machines at Travelling Wire, the machines were regularly running at capacity carrying the load for the business with a few ageing machines alleviating any remaining capacity. To continue its growth trajectory, the company needed to invest in more EDM technology. So, in November 2022, the company took delivery of a Mitsubishi SG12S spark erosion machine and a Mitsubishi MV2400R wire erosion machine.

Looking at the new Mitsubishi SG12S spark erosion machine, Richard Weller says: “This machine has been a complete game-changer. We had an old machine that had an auto-tool changer, but it didn’t work well. Setting up the old machine was a cumbersome task and it was difficult to use. Every time we needed to conduct a secondary task, we’d have to manually change tools and re-set the machine. The Mitsubishi SG12S has eliminated all of this with its 20 position tool changer. ETG also supplied a lifter table and magnets, Erowa toolholders and a probing system as part of our package. The additional investment was worth every penny.”

The additional equipment accelerates setup times and the on-machine probing system significantly improves precision and repeatability. As Richard Weller adds: “Three of our team had 3-days training with ETG on the new Mitsubishi SG12S and, during the training, we learnt a lot of new methods for working as well as gaining an understanding of the machine. We also invested in the Esprit CAM software system from ETG and this has also enabled us to improve our workflow.



The Toolchanger on the Mitsubishi SG12S

“While the toolholding and CAM investment have made improvements to our setups, the major difference is when parts are running. Not only are our cycle times at least 50 percent faster, but the machine will run uninterrupted for long periods. We recently machined 18 parts and each part needed a slot sparked. On the old machine, this would have been a minimum of 36 re-setting interventions, but on the Mitsubishi SG12S, the parts were probed and the machine completed the job with no interventions.”

Alongside the new SG12S is the new Mitsubishi MV2400R wire EDM. Richard Weller says: “We thought the BA24 machine in 2019 was a step up from our previous technology, but the MV2400R is at least 40 percent faster than that machine. The MV2400R is a brilliant machine. The wire continually re-threads with precision, there are no maintenance issues, the setups are fast and stable processes and the touchscreen control and software are just amazing to use. The MV2400R is giving us a huge capacity boost with its ability to work around the clock at speed with minimal downtime. Furthermore, the quality of the finish is exemplary.”

In conclusion, Richard Weller says: “The new machines have transformed our business and there is so much more to come. The quality and precision of our work has improved and, with the enhanced capabilities of these machines, we are winning more contracts from the end-users; the automotive, food and pharmaceutical



The Wire Feeding System on the Mitsubishi Machine

manufacturers that demand quality at the highest level. Not only can we exceed the expectations of these new customers with the Mitsubishi machines, but we can also supply shorter lead times with more competitive pricing. I absolutely love the Mitsubishi brand and the technical support from ETG has been outstanding.”

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Additive manufacturing specialist optimises base plate removal with new Sodick wire EDMs

CA Models, a specialist in high-quality, fast-turnaround metal and plastic additive manufacturing, is using new investment in two wire-erosion machines from Sodi-Tech EDM to optimise the process of removing 3D-printed parts from its build platforms. With sectors such as Formula One currently in development for next year's cars, the new Sodick machines are making a real difference to operational efficiency at this progressive and highly successful business.

Established in 1983, Stirling-based CA Models has been setting the standard for excellence in rapid prototyping for decades. Providing a varied, extensive and streamlined service to meet the challenges and demands of a growing market, CA Models has five different additive manufacturing departments, including metal laser sintering. This process allows components to be 3D printed from powdered metal that includes aluminium, titanium and steel. The 35-employee company can provide printing, finishing and optional post-machining, all in-house.

"We had two Sodick wire EDM machines that were still running well but getting on in years," explains founder and managing director Clark Campbell. "I felt it was the right time to bring in some new technology for the next decade. The new Sodick machines are even more accurate and faster. At CA Models we are in the 'quick' business, where just about every client wants their parts yesterday. That's why we need an in-house resource when it comes to wire erosion.

With two Sodick machines already in-situ and proving their worth over many years, the company had no hesitation in returning to Sodi-Tech EDM for its new investment.

"I think Sodick technology is brilliant and the reliability of the machines warrants some loyalty in my opinion," says Clark Campbell. "I went to an open day at Sodi-Tech EDM's Warwick facility and was really impressed with the latest machines, which will play their part in a big way over the coming years."

Installed in September 2022, the new Sodick ALC600G and ALC800G wire EDM machines are already busy.

"For example, take a titanium build platform with 14 motorsport parts on the base," says Clark Campbell. "When the printing process is complete, the entire platform goes into our furnace for heat



treatment for 24 hours, after which we wire-off all the components from base plate using our Sodick technology. As the wire cuts so finely we do not lose any dimensional accuracy in the parts. Furthermore, the machines wire so quickly that we get a head start in finishing the components. Although this process is the underlying reason behind our investment, we also get many subcontract CNC machining projects, some of which lend themselves to wire EDM. It's great to have that flexibility, particularly for complex, intricate parts required by sectors such as Formula One."

The ALC600G is a rigid linear motor driven wire EDM machine that offers features such as Sodick's next-generation SPW control with Smart Pulse Generator and other performance boosting technologies. While offering axis travels of 600 x 400 x 350 mm, CA Models thought it prudent to also invest in the larger Sodick ALC800G wire EDM, which provides 800 x 600 x 500 mm, Z-axis option of 800 mm.

"As far as wire EDM is concerned it's always nice to have a big machine because we sometimes get large or unusual requests," explains Clark Campbell. "I think we're the only company in the UK to have the ALC800G model."

Without the Sodick wire EDMs, CA Models would have to remove additively manufactured parts from base plates using its large bandsaw, which is far from ideal.

"It's something we've done before, but it always feels a little unsafe and not exactly best-practice in my opinion," states Clark Campbell. "Wire EDM is far more practical, efficient and effective. Furthermore, once finished, the support plate looks brand new and ready to use again, which is really helpful."

Although CA Models serves clients across a host of industries, among the busiest sectors at present is motorsport, particularly Formula One, where teams are designing and manufacturing parts for next year's cars.

Clark Campbell concludes: "Undoubtedly, the parts will end up on the Sodick machines for base plate removal. It's something we've come to rely on."

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Brandauer invests in GF AgieCharmilles

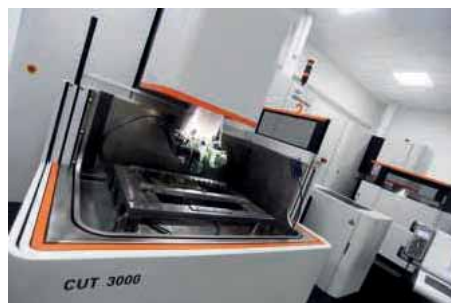
Wire EDM technology from GF AgieCharmilles is fully interfaced with the appropriate CAD/CAM software. This state-of-the-art technology and the skills and experience of Brandauer engineers will deliver a complete manufacturing solution for every situation.

The technology utilised in the wire EDM cell is very rare in the UK and carries benefits which will increase accuracy and speed to market for any new tooling requirements.

Brandauer operate two AgieCharmilles GF CUT 3000 machines, an investment that is typical of the firm's constant drive for precision in every respect. These machines are 1 micron capable, on a long bed CNC table geometry, making high speed, high precision, 1,250 mm modular tools a reality.

Fundamental is the increased machining speed thanks to the Direct Power supply module. Through its wire EDM technology, Brandauer meet the challenges of miniaturisation and high precision while maximising productivity.

Brandauer can machine with wires as small as 0.05 mm in diameter and thanks to the



crossed table situated directly under the workpiece to be machined, high precision guides and high-precision glass scales are situated as close as possible to the machining zone. This choice contributes to the factor of maximising precision and the repeatability of positioning. The play in inversion is almost eliminated.

Operating alongside the GF AgieCharmilles CUT 3000s is an abundance of other advanced machinery including the GF AgieCharmilles CUT E600 for general purpose EDM machining and the GF AgieCharmilles DRILL 20, often used for drilling starting holes with the electrode range \varnothing 0.1-3.0 mm.

Brandauer has built a reputation for



engineering excellence, investing in the future of UK manufacturing and applying the most precise approach to developing relationships.

Brandauer's principles are many and varied and are evident in its communications internally and externally. From creating a culture of integrity throughout the business to its consistent position as the positive voice in industry conversations, Brandauer has led the way for approaching 160 years.

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MAKINO

Promise of Performance

CERATIZIT launches ISO-P update for its EcoCut series

ISO-P steels represent the largest of all metal material groups so, for cutting tool manufacturers, covering all bases can be a challenging task.

However with the updated version of its tried and tested EcoCut series, tooling specialist CERATIZIT is now delivering high-performance solutions for the universal turning and drilling of ISO-P steels.

The list of ISO-P steels is long and its diversity demands a wide range of high-performance tooling solutions. When low carbon, ductile and high-alloy steel grades of different hardness arrive at the turning centre for machining, no single product in isolation can tick all the boxes.

Which is why the turning specialists at CERATIZIT have repositioned indexable insert grades to accommodate the machining of ISO-P materials. The classic EcoCut has also been updated to tackle the machining of challenging steels.

Whether it's drilling with a stationary or rotating tool, or the turning of face, inside or outside profiles, CERATIZIT says the EcoCut is the Swiss army knife of cutting tools and the first choice for a wide range of applications.

Alongside the EcoCut Mini and EcoCut ProfileMaster, EcoCut classic tools offer true versatility within the series. Diameters from 8 to 32 mm can be machined with their indexable inserts, providing reduced setup times and increased productivity.

"EcoCut tools have long been excellent performers in our product range, but that doesn't mean we're resting on our laurels," explains Paul Höckberg, product manager for cutting tools at CERATIZIT.

"On the contrary, the supplementary -P designation brings with it the capability for machining ISO-P steels. The user can either increase cutting data and machine faster or stick to original parameters and benefit from



longer tool life. Extensive tests have shown that the new EcoCut-P grades offer 15 percent greater performance than their predecessors.

"For the best machining results in steel you also need an optimised coating so we've developed our special Dragonskin coating for ISO-P materials which is engineered to increase tool life and reduce machining time through an optimised layer structure," adds Stefan Karl, product manager for cutting tools at CERATIZIT. The mechanical post-treatment induces a state of residual stress in the layer surface, which in turn increases process security.

Dragonskin grade CTCP425-P with an advanced AL2O3-TiN CVD coating is particularly impressive when uninterrupted cuts are required. It delivers excellent wear resistance even at increased cutting speeds.

For general steel machining with interrupted cutting, the AL2O3-TiN CVD Dragonskin grade CTCP435-P offers an ideal solution: "Whenever poor machining

conditions exist and in all applications where a high degree of toughness is required, CTCP435-P comes to the fore with its stability and reliability," Stefan Karl confirms.

Another advantage for EcoCut-P users is the new indexable insert indicator layer which allows the user to monitor insert wear progress and know when it's time for a replacement. If wear is detected too late, machining quality may already be severely impaired.

"It can be a very costly problem," Paul Höckberg asserts. "If the machine is being driven hard and the cutting insert breaks through wear, in the worst-case scenario the workpiece will already be damaged, often with significant financial consequences. The new indicator layer provides plenty of warning when a replacement insert is required."

Users will be pleased to learn that this enhanced performance comes at no extra cost: "The new EcoCut-P indexable inserts deliver up to 15 percent higher performance in ISO-P steels but at the same price as their predecessors," Paul Höckberg concludes.

The new ISO-P EcoCut cutting inserts will be available from stock in February 2023.

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Multi-tooth PCD cutter for high speed finishing

A new, high-feed milling system for productive finishing of non-ferrous metals and plastics has been introduced by Horn Cutting Tools, Ringwood. Designated DTM 1710, the tool system employs inserts with Polycrystalline Diamond (PCD) cutting edges brazed onto cassettes that can be finely tuned axially to micron precision via adjusting screws on the tool carrier. The PCD substrate is precisely laser-cut to achieve high surface quality during the finishing process. Axial run-out is set by Horn engineers before the tool is delivered.

Compared to other tools of this type on the market, the Horn milling system offers a higher number of cutting edges for any given size. The tools are available in the diameters 50 mm, z = 10, 63 mm, z = 14, 80 mm, z = 18, 100 mm, z = 24 and 125 mm, z = 30, z representing the number of inserts. All variants have an internal coolant supply directly to the cutting edge.

To achieve a high quality machined finish on the workpiece and to enable use at high

speeds, the tool must be finely balanced with the tool holder, for which purpose balancing holes are provided around the cutter body. To achieve the best possible results, the entire machine environment must be taken into account and brought to the highest possible level of stability. The combination of the machine design, guideways, spindle and workholding system as well as the milling tool have a decisive influence on the result.

The aluminium alloy milling body is lightweight, minimising centrifugal force and hence prolonging spindle life. For long-term protection against abrasion from chips, the cutter body is surface treated.

The Horn high-performance PCD cutting material is composed of a mixture of different



sizes of diamond grains. As the proportion of diamond by volume increases, so do the effective hardness, toughness and cutting edge quality. For the DTM 1710 milling system, Horn offers two different PCD substrates to suit the material to be machined.

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Floyd shows good form with Schwanog turning system

The machining of complex forms can be a significant challenge for manufacturers, especially if the batch size is considerable. Luckily, Floyd Automatic Tooling can now provide remarkably precise form tools for even the most challenging of material types thanks to the impressive Schwanog range of form tool solutions.

When establishing complex forms, productivity and precision are of paramount importance. Nowhere is this more of a challenge than the machining of hard materials. Now, Schwanog and Floyd Automatic offer the perfect solution with special form tools and form 'cut-off' tools that guarantee the smooth transition of contours, impeccable precision, surface finishes and component quality.

How is this achieved? Often it is difficult to manufacture more complex forms on the 'cut-off' side of a part using a standard 'cut-off' tool. In these situations, it is the application of a Schwanog form tool that can make the difference and ensure a smooth contour transition. Simultaneously, at the start of the next part, forms or corner breaks can be added. This results in a reliable tool with immense cycle time savings. Of course, the key requirement for success is the use of a twin-spindle turning centre. However, with a twin-spindle turning centre and Schwanog form tools, most complex forms can be manufactured process-safe with significant time savings due to adding of forms or corner breaks at the start of the next part.

The scope for the Schwanog form tools from Floyd is huge and extends way beyond 'cut-off' tools. The series is suitable for external and internal turning, grooving and much more. Regarding external turning, grooving has emerged as a more efficient solution compared to single-point turning for almost all machine types in numerous industries. Floyd now offers various systems that are the perfect solution, as the Schwanog tools are individually manufactured to customer drawings. This makes the system available for various cutting widths and machine types. For example, the Schwanog system can be created with OD grooving tools, OD grooving tools for Escomatic and rotary transfer



machines, shaving tools, skiving tools, modular MSIK systems and DCI Swiss-type grooving systems.

Depending on the contour, internal turning and grooving of parts can also be complex and very challenging. Compared to OD grooving, rigidity, coolant and chip removal play a more significant role. With 5 different tooling systems for ID machining, Schwanog offers the perfect, cost-effective solution for almost any application, regardless of whether it's radial or axial internal turning or grooving.

The form tool line also incorporates form drilling. This is one of the most frequently applied operations when machining precision small parts. The Schwanog form drills with exchangeable inserts are recommended wherever drilling tolerances are below ± 0.02 mm. There is no need for adjustment during tool changes and the exchangeable insert is significantly more cost-effective than solid carbide form drills. If tighter tolerances or greater drilling depths are required, Floyd Automatic can offer Schwanog solid carbide form drills that are individually ground to suit sizes, specifications and material types.

For the machining of threads, there are a variety of processes for different components, thread profiles and thread pitches. Each process offers individual

advantages for specific working conditions and Schwanog can cater for them all. Whether it's OD or ID thread whirling single-point turning of OD or ID threads, Floyd Automatic can deliver the solution. This also applies to form milling tools for the machining of serrations, grooves and specially milled forms. This is complemented by the ability to provide a comprehensive offering of broaching tools for gear, groove and the machining of special shapes.

The almost infinite range of tool and form options is supported by an unprecedented depth of toolholder designs. So, whether it's square shank toolholders for basic VDI toolholders, cartridges for WEP and PWP tooling systems or customer-specific solutions, Schwanog can manufacture the solution. For more than 75 years, Schwanog has been developing and manufacturing special insert tools to meet the diverse requirements of the industry with a high degree of innovation. This innovation and creativity are applied to both insert design, suitable base bodies and toolholders.

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Allied offers an interactive experience

Allied Machine and Engineering, a leading manufacturer of holemaking and finishing cutting tools for the metalcutting industry, has announced the addition of Allied Europe, located in the UK and Wohlhaupter, located in Germany, to its online digital platform. With Allied's Interactive Experience, users can now virtually visit the Allied Europe and Wohlhaupter facilities, meet various members of the global Allied team and discover how Allied Machine and Engineering provides world-class holemaking and hole finishing solutions worldwide.



Users will be able to access digital resources like literature, videos and online tools and training for these locations in addition to virtually visiting their training and engineering departments, exploring tooling solutions and meeting their customer service and marketing teams. Navigating through Allied's Interactive Experience allows end users, distributors and anyone else interested in Allied Machine to meet global teams as they make a difference for the company and provide best-in-class customer service worldwide.

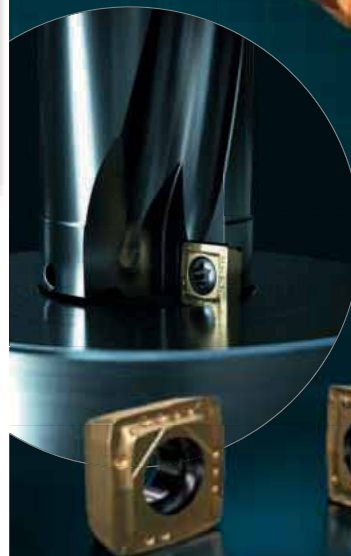
Including Allied Europe and Wohlhaupter within the digital platform allows Allied Machine to maintain the priority of building relationships with customers as if they are able to visit in person. This addition to the platform provides the unique opportunity to get to know Allied Machine as a global tooling solution provider. Frank Wohlhaupter, managing partner of Wohlhaupter, says: "We are thrilled that our parent company Allied Machine has enabled us to have our own Interactive Experience and are very pleased to present our company in this way."

Paul Crawford, managing director at Allied Europe, adds: "I am pleased and excited to invite customers whether new or old to try our 'New Interactive Experience' where you can see what's behind Allied Europe and our holemaking solutions and technical support. I really hope you enjoy the experience where you can walk through any door and meet up with some of our team."

To access Allied's Interactive Experience and learn more about the holemaking experts, visit: <https://experience.alliedmachine.com>

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Reaping the benefits of horizontal milling on a VMC

Machinists have long recognised the productivity benefits of fixturing multiple parts on a tombstone or column on the rotary table of a Horizontal Machining Centre (HMC). What many Vertical Machining Centre (VMC) users do not realise is that similar functionality is available for their machines using an Indexer Sub-System (ISS) from Chick. Manufactured in the US, it is available in the UK and Ireland through sole agent 1st Machine Tool Accessories.

The advantages of horizontal milling are twofold. First, swarf falls away under gravity and does not clog the machining area. Second, the ability of a column on the rotating table to present numerous components to the spindle allows intelligent cutting cycles to be programmed that minimise the number of tool changes, leading to higher productivity.

1st MTA offers a Chick Multi-Lok column for use on an HMC. However the same unit may be rotated through 90 degrees and mounted horizontally between a 4th axis indexer and a tailstock on the table of a VMC to achieve the same multi-part fixturing benefits, as well as gravity swarf clearance as the column sits between centres well clear of the table.

Due to the machine running unattended for longer, productivity and walk-away time are both increased. It allows the operator to carry out other jobs, including attending to other machines.

Cost-per-part machined is also lower. One reason is because a more efficient cutting cycle can be programmed to optimise the number of tool changes and Multi-Lok indexings according to the type of component, the production mix and whether it involves an Op 10/Op 20 strategy.

Another reason for reduced machining cost is the ability to fixture a larger number of components per cycle by taking advantage of more of the vertical space within the VMC's working area than is possible if components are clamped directly onto the table. In other words, why invest in a half-metre-cube production centre and only use 500 x 500 x 150 mm of the available volume?

There is an additional advantage of using a rotating column to fixture multiple parts on a

VMC. Depending on how they are clamped, there is opportunity within the cutting cycles to perform machining operations on the edges of components, saving either having to exchange an angle head into the spindle or perform a second operation.

Users describe how ISS has helped them

So much for the theory; the experiences of a couple of typical users will explain more. Armac Martin, a Birmingham manufacturer of luxury fittings for kitchens and furniture, started out using Chick Qwik-Lok dual-station workholding units to increase profitability and at the same time improve quality. The operator only has to turn a single handle to squeeze two parts simultaneously against a common, fixed jaw in the centre. Opposing forces are cancelled and a reliable reference point is provided for machining.

As business increased, more and more blocks as well as window and door furniture such as bolts and catches needed to be machined on the sides as well as the face. If such components are held in a standard Qwik-Lok, further setups and separate operations are needed to complete each part, lengthening floor-to-floor times and potentially compromising accuracy due to repeated relocation.

The solution provided by 1st MTA was a four-sided Multi-Lok ISS unit mounted on the machine table. All the benefits of Qwik-Lok workholding are retained, as each face of the column constitutes the identical workholding arrangement. The same snap on/snap off interface means that jaw sets and other accessories are interchangeable between Qwik-Lok and Multi-Lok systems.

The two ISS units in operation in Birmingham constitutes the identical



Machined acrylic manifold blocks being unloaded from the Chick ISS at subcontractor Stratos Precision Engineering, Gloucester. The components sit high in the machined soft jaws, allowing tools to access the top, front and back. A 4-sided ISS like this is the norm, although 6- and 8-sided versions are also available



Dissimilar brass fittings set up for machining on a Chick ISS on one of the VMCs at Armac Martin, Birmingham. After the faces of the first set of parts have been machined, one or two edges of each component can be accessed after indexing, reducing the need for additional setups

workholding arrangement programmed to index by 90 degrees, as workpieces are usually orthogonal, but occasionally components are set at intermediate angles for machining. Some drawing tolerances are surprisingly tight for this type of product, down to ± 0.1 mm, the idea being to minimise subsequent hand finishing and preserve the form of the fittings.

Hundreds of soft aluminium jaw sets, some machined for specific jobs and others for families of parts, are fitted to any of the workholding units. Such jaws allow parts of irregular shape to be held more securely and heavier cuts to be taken compared with if hard jaws are used.

In another application, subcontract machining of plastic parts constitutes the vast majority of output at the Gloucester factory of Stratos Precision Engineering, where high volume production of a particular component was causing problems. It is an acrylic manifold block for a flow control device that previously had to be clamped three times in conventional vices mounted side by side on the table of a vertical machining centre.

This process has been replaced by a Chick ISS from 1st MTA, with very positive results. Most notable is that the operator is now able

to fixture eight plastic billets at a time, close the machine doors and walk away for an hour to do other jobs. On his return he unloads eight parts machined on three faces, ready for a second operation to mill away material from the back face.

Previously, the three cycles were carried out sequentially in individual vices mounted on the machine table. It meant that the operator had to be almost permanently in attendance to open the doors, reset the components and close the doors to be able to extract one finished part after every 15 minutes, i.e. four per hour.

Production output is thus doubled, despite the cutters being in contact with the material for a similar length of time. The saving comes purely from less handling of the components coupled with the opportunity to program fewer tool changes. One cutter can move around at least two parts rather than one and potentially eight if the cycle time can be shortened by rotating the column rather than exchanging the tool when machining any given feature.

The other major advantage of the new workholding solution is a reduction in scrap from around one part in 20 to virtually zero, as the risk of tolerance build-up through

repeated refixturing is eliminated. Previously, if the operator did not blow swarf comprehensively from all of the vice jaws, the resulting misalignment of the component in any one of them meant that features could fall outside drawing tolerance, which is down to ± 0.05 mm.

With parts now set up nearer to eye level and the fact that the column indexes through 360 degrees during the hour-long cycle, a lot of swarf falls away. Management of chips in the jaws is much easier and in practice workpieces always seat correctly in the Qwik-Loks. The only time a component now has to be scrapped is if a tool breaks in-cycle, which is rare when cutting plastics.

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Schmalz vacuum clamping technology gets to grips with metal cutting

The drive to continually improve productivity and efficiency is leading a growing number of manufacturers to review their processes and technologies to look for opportunities to gain a greater competitive advantage.

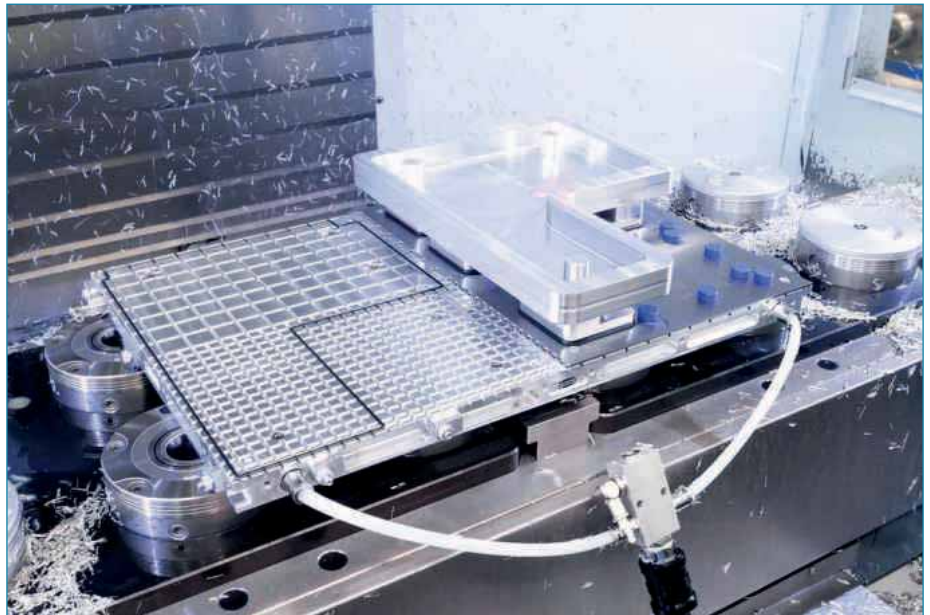
For those businesses involved in CNC Machining, the prime focus for many is selecting the most appropriate cutting tool technologies and optimising machining speeds. There are however further efficiencies to be gained by re-visiting workpiece clamping technologies, as time spent removing and replacing workpieces is of course non-productive time.

Vacuum clamping offers a number of opportunities to improve efficiencies due to the short set-up times, plus the added benefit of allowing access to machine workpieces on all sides in a single setup. Additional advantages of vacuum clamping include the fact that the tooling is simpler and that completed parts can be removed and replaced with another one quickly and easily. Just turn off the vacuum to release the finished parts and turn on the vacuum once again to secure the next part for processing.

For those business with a requirement to machine multiple product variants, the inherent flexibility of vacuum clamping technology provides significant advantages, not just in the quick setup and changeover times, but also by eliminating the need for other bespoke tooling or mechanical clamping systems.

As a leader in vacuum automation, Schmalz has developed a comprehensive range of vacuum clamping modules and systems applicable to multiple applications across diverse manufacturing operations.

The main part of the Schmalz system is the



Schmalz vacuum clamping technologies offer a wide range of benefits

MPL Matrix-Plate, which is the base for the modular clamping system. Part positioning and location is then achieved using a number of individual ISBL vacuum blocks, manufactured from aluminium. These also incorporate double seals and an integral magnet to allow them to be pre-located over the vacuum holes on the steel suction plate, which is secured by vacuum on the MPL Matrix-Plate. The suction plate incorporates multiple vacuum openings and any vacuum openings on the steel plate, which are not currently being used are covered using sealing magnets. Individual suction plates can be removed and reinstalled easily as required. A further alternative available in this highly flexible system is the SFM FlexMat, which can be used on the steel suction plate



The SFM FlexMat, shown in blue here, can be used as an alternative to the ISBL vacuum blocks

instead of the ISBL vacuum blocks. All materials used in the Schmalz modular clamping system have been specially selected for optimum use alongside the typical industry cooling lubricants.

Schmalz vacuum products are used across a diverse range of industry sectors and applications including machining, logistics, the automotive industry, the electronics sector and in furniture manufacture. The Vacuum Automation business unit offers a comprehensive component portfolio which includes suction pads, vacuum generators, complete gripping systems and clamping solutions for holding workpieces.

Schmalz UK Ltd
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Schmalz modular clamping system includes ISBL vacuum blocks – top left, steel base plate and sealing magnets left and the MPL Matrix-Plate – right above



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AMF clamping technology supports production at pioneering Hungarian supplier

“There is one of our parts in almost every car”

It is well known that Eastern Europe has excelled in metalworking for a long time. However, one supplier in Hungary stands out above the rest. A manufacturer of aluminium die-cast parts for major OEMs in the automotive and large-scale industries processes these parts into important components. A complete system for workpiece clamping on the machine table is created from a clever fixture construction and efficient zero-point clamping technology from Andreas Maier GmbH & Co. KG (AMF). It is so flexible that the machines can be set up quickly for both mass production and small-series production. Even the most prestigious customers are impressed.

“Through consistent investments in top-class machining and manufacturing technologies, in the past few years Fémalk has developed into one of the most in-demand manufacturers in the processing of aluminium die-cast parts in Eastern Europe”, Samuel Netzer, AMF sales engineer for Northern and Eastern Europe, reports. The company is proud of how its business has developed since 1989. The engaged and qualified employees produce castings weighing from 30 g to 5,500 g in the modern factories, thanks in no small part to the modern clamping technology from AMF. It is not hard to believe the company spokesperson when he says that “almost every car in Europe has at least one of our parts in it.”

Cycle times can only be achieved with modern clamping technology

In order to achieve this, Fémalk invested not only in buildings, machines and employees, but also in highly efficient clamping technology. What began with individual pilot projects and simple hydraulic clamping elements from AMF has been expanded in recent years into effective clamping technology with automation and zero-point clamping technology. This has reduced setup times so significantly that machine utilisation

has soared. This is all thanks to a clever in-house design engineer. Gábor Soós, who is responsible for fixture construction. He has always thought ahead and, together with AMF representatives, searched for optimisation potential. The clamping technology is now so flexible, as well as partly automated, that the machines can be setup just as efficiently for small quantities, such as for a Bentley, as for mass production for VW. In addition, the company has equipped 15 processing centres with the most modern zero-point clamping technology from AMF. It started in 2015 with a simple angle clamp, but they now have a range of around 200 fixtures that are equipped with bolts for the zero-point clamping interface. The specially developed fixtures include a base plate with pull-studs for each machine, which are held by the zero-point clamping modules. The consultants at AMF were able to provide efficient support with many tips and a wide range of products. The products the company uses include swing clamps, clamp arms, stop valves and pressure accumulators, in addition to quick-release couplings, pressure gauges,

vertical clamps or support elements and lines, as well as coupling nipples for media ducts.

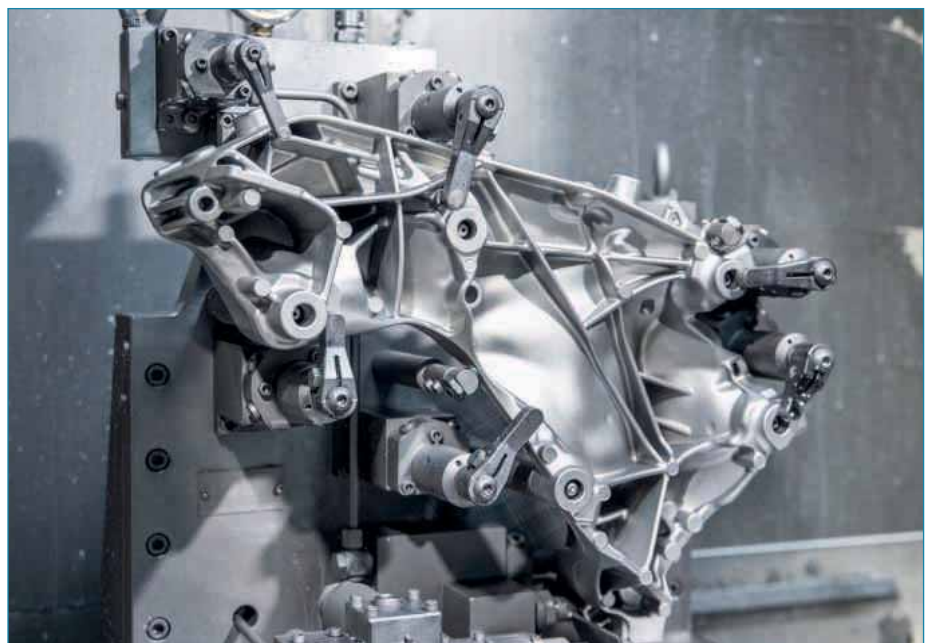
“The fact that one supplier has so many products in its range has been very helpful for us and has greatly simplified procurement.” emphasises Gábor Soós.

Wide product range from AMF simplifies procurement

Four fixture variants with pressure-regulating valves and multiple media ducts on the base plates ensure maximum flexibility. “This means that, for example, all consumer circuits can be controlled with different pressure levels and, as an extra feature, they can also be controlled with a delay”, Samuel Netzer points out. This solution means that the support element can first be extended to hold a workpiece and then the clamping fixtures can be closed.

Setting up during operation

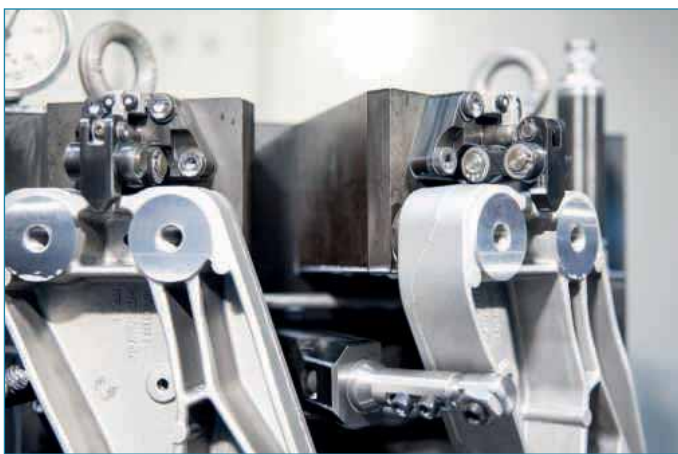
The base plates each come equipped with four K 10 zero-point clamping modules. With a force of ten kilonewton each, they reliably pull in the pull-studs on the base plate with a



repetition accuracy of 5 µm, close it securely and hold it tightly with a force of 25 kN. The modules are opened hydraulically with an operating pressure of 50 to 60 bar. Because the pressure lines are mechanically closed using spring force after clamping, they can then be disconnected at any time afterwards.

The fixtures are loaded outside of the machine with the aid of a pressure accumulator. This means that the next machining operation can be prepared outside the engine room, while production continues. The components are clamped before being transferred into the machine. This is the only way to keep setup times to a minimum, so that the parts, which the 42 die-casting machines cast mostly fully automatically, can be processed without any major delays. The series production must handle both small- and large-scale batches, with quantities of between ten and 15,000 units per week.

Gábor Soós explains: "Small-series production requires a quick



change of fixtures to maintain a high level of machine utilisation, particularly at the start-up phase of a new product."

The parts are used in many major OEM plants around the world

The company process an incredible 4,000 tonnes of aluminium into die-cast parts every month. Further processing sees these parts turned into a range of products including chassis parts, engine and gear bearings and electrical circuit housing, as well as complex air-conditioning compressor parts and headlight or thermostat housings. It delivers these to many OEM plants worldwide, including, for example, BMW, Bentley and Porsche, as well as VW, BASF and Boge. Fémalik ranks as a 1st-tier supplier to most of these companies.

With well-trained, committed and motivated employees and through dynamic growth, the company has developed a significant position in the European supply industry. In addition to the die-casting machines and processing centres, the company also has a wide-ranging manufacturing system that includes six CNC lathes, four washing machines and drilling and thread-cutting machines, along with special press-in machines, blasting machines or mass finishing machines. The close relationship with the clamping technology experts at AMF has been producing efficient solutions for over ten years. As a result, the zero-point clamping technology from the Fellbach-based company is a firm favourite with the Hungarians and is always included in the planning for each new processing centre.

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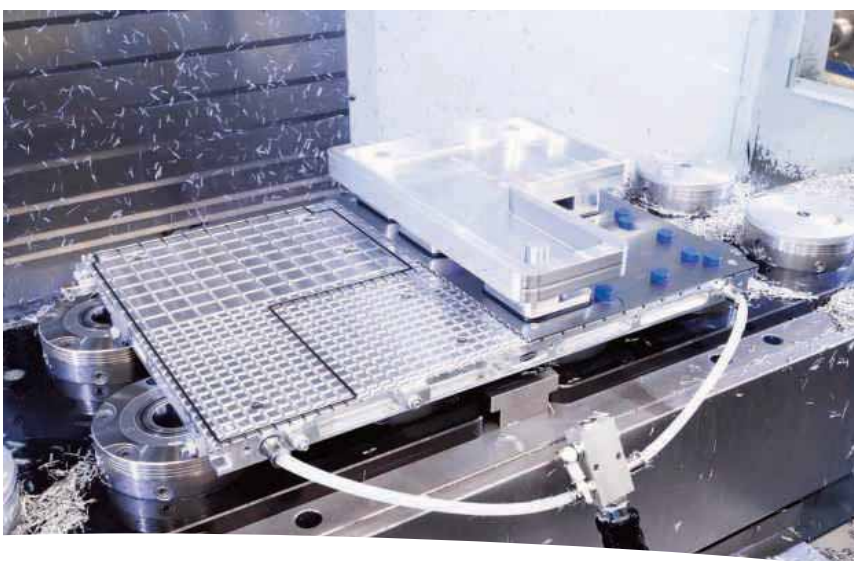
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Ergonomic bicycle assembly boosts productivity

Flow lines prove popular alternative to conveyor belt assembly

At Rose Bikes in Bocholt, 120 different bicycle and e-bike models weighing between 5 kg and 28 kg are ergonomically manufactured in six flow lines with the help of flexible Bike Promobil assembly carts produced by Roemheld, Laubach. The result of a joint development project between the two German companies, the cart is now being sold worldwide, including in Britain and Ireland through Roemheld UK.

A shortage of potential employees in the Bocholt area, near the Dutch border, prompted family-run Rose to look for a production solution to meet increasing demand for its products. Instead of producing on a conveyor belt, as is the case with other bicycle manufacturers, Rose chose the flow line option when it opened its new factory in 2020. It was deemed to be a more attractive environment in which to assemble bikes.

Stefan Strauss, production manager at Rose explains: “The conveyor belt is too inflexible and tends to stress employees. Flow line production is much more operator friendly, so it is easier to find new staff and to train them. Work should be fun. We don’t have anyone watching with a stopwatch and staff take turns at different stations to maintain their interest.”

He is a trained bicycle mechanic and has remained loyal to the company since 1983 when he began his apprenticeship there. Today he is responsible for 80 employees, 70 of whom work in production of a wide range of products extending from simple mountain bikes retailing at just under 800 euros to high-end road bikes with carbon fibre frames costing ten times as much.

Stefan Strauss originally wanted to design and build an assembly aid himself, but did not



have enough time. So, in 2020, Roemheld offered an early version of the cart, but it was too big, heavy, inflexible and expensive. A development partnership was formed to address these issues. One elegant idea the team came up with was to hold the bike not by gripping on the frame but by placing an insert into the seat tube.

Roemheld eventually produced and supplied 130 of the refined Bike Promobil flexible assembly carts to facilitate work on every Rose model in every position. They boost productivity by ensuring that operators do not over-exert themselves and become tired too quickly. Simple bikes are assembled in two lines with a maximum of eight stations, while complex bikes require up to 15 production stations. A push bike without gears is ready in 50 minutes, whereas the top e-bike model requires around 220 minutes for assembly.

Without the need for any external power supply, the mobile cart is used for all assembly tasks in bike production. It allows Rose to design production lines for efficient and flexible processing and to react quickly to changing customer orders and material availability. The workholding device enables employees to take on different assembly tasks so that their

work is more varied. Stefan Strauss says: “Our goal is that every fitter is able to work at every station.”

The unit has a heavy base frame but is easy to move on large castors. When working on a bike, the mechanic locks the cart using a foot pedal. The ability to index the frame in two rotary axes allows it to be fixed precisely in numerous positions and rotary couplings mean the bike can be moved infinitely in any direction. The rotary axes also allow the bike to be swivelled sideways so that the bottom bracket and brakes are easy to reach.

If the operator needs to change the height, it is simply necessary to guide the bike diagonally upwards or downwards. Adjustment of a gas spring using a spanner enables variable load compensation in seconds, allowing the cart to support the weight of the bike as it becomes progressively heavier during the assembly process.

Stefan Strauss concludes: “Our mechanics are very satisfied with the Roemheld assembly cart. At the beginning, some employees were a little uncertain due to the multitude of adjustment options. But after trying it out and becoming familiar with it, the sceptics are now entirely convinced. Everyone wants to keep the Bike Promobil.”

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Leader extends zero-point offering with Mate Precision Technologies

Following a recent partnership agreement, the full range of Mate Precision Technologies' high precision zero-point fixturing is available in the UK from workholding and machining efficiency specialist, Leader Chuck International.

Being one of the latest players to enter the zero-point fixturing market, Mate Precision Technologies was all too aware of the need to bring significant advantages over the competition when it launched its next generation Dyno range.

Consisting of DynoGrip vices, DynoLock base plates and DynoMount tombstones, the ethos behind the range stems from Mate targeting manufacturing efficiencies within its own workshop. With an enviable reputation for producing high quality punch press and pressbrake tooling for manufacturers across the globe, the company employs around 300 highly skilled staff at its manufacturing facility in Minnesota, USA. So the need for machining efficiency gains comes from worldwide competition.

Extensive trials of the previous generation zero-point systems, available from established suppliers, under real life production operations highlighted a number of limitations that have been addressed by these new products from Mate.

Leader Chuck's managing director, Mark Jones, explains: "With Mate's extensive knowledge of the high quality tool steels and the fine tolerances used to produce its tools for sheet metalworking, it is only



logical that the same materials and processes are used for the Dyno range of fixturing. It is why the company offers a 'zero wear out forever' policy across the range with a 100 percent unconditional customer satisfaction guarantee."

Mate DynoGrip self-centring vices are engineered to shorten setup time and reduce process variability. Two zero-point four-stud engagement patterns are offered, 52 mm and 96 mm, that are compatible with other systems or can be mounted directly to the machine table via toe clamps or bolted through the body.

Available in 13 sizes, the vices feature quick change jaws with an innovative 'click-lock' system for quick setup, and a 45° angle on the top jaws to pull the workpiece down into the vice body for maximum rigidity during heavy cuts. They can also be quickly reconfigured to grip outwards with the jaws holding the internal walls of the component or billet.

Production flexibility is further supported by the vice's ability to hold two parts at the same time. "With a fixed centre jaw and the quick removal of a locking pin the vice becomes dual-station. Even dissimilar sized parts can be securely held simultaneously with absolute confidence," says Mark Jones.

With 11 size and shape variants there is a DynoLock base to suit any machining



application. These quick-change workholding bases are the foundation of the workholding system and the key to superior productivity. The product mounts to the machine bed, tombstone, pyramid, or riser, and offers best-in-class accuracy and repeatability with a superior holding force. "Mate takes the term zero-point very seriously," Mark Jones states. "DynoLock has what it takes to securely hold your vice, whether you change the same vice repeatedly or exchange it for a different one. DynoLock reduces your machine setup times and keeps your spindle cutting."

For increased volume production applications and higher part loading density, DynoMount three- and four-sided tombstones are available for use with Mate DynoLock 52 and 96 bases. Using a chambered design for weight reduction, Mate tombstones also include a hoist ring lift connection for easy loading and unloading. Like the rest of the Dyno range, they feature Mate's QuickSpecs 2D bar code tag for real-time access to full product specifications, CAD files and potential integration into your business systems. Direct-to-table mounting, and custom mounting bores are also available. They are also compatible with some competitor workholding bases when used with applicable bushings and hardware.

Mate's mission is to personally respect, support and inspire metalworking professionals around the world with high-quality products and services for factory productivity. Mark Jones concludes: "In the design and build of these units Mate wanted to match or exceed the tolerance levels achieved by the leading machine tool



suppliers. In short, if you are approaching or aiming for better than single digit micron tolerances and consistent repeatability of your machined components then this is the only zero-point system for your workshop."

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Ergonomic rotary index table raises efficiency of portable arm metrology

The speed with which someone can inspect a component using a portable, multi-axis measuring arm is increased by up to 40 percent if, instead of the part being static, it is placed on a new FREEDOM Index Table from LK Metrology, Castle Donington, UK. The Coordinate Measuring Machine (CMM) manufacturer says that not only is inspection more efficient, but also in some cases it is possible to use a smaller, less expensive arm to access all areas of a component. In other words, the effective measuring volume of any arm is increased.

Rotation may even avoid having to relocate the arm to enable sufficient access to the back of the part, which would lengthen the measuring cycle and could introduce inaccuracy. Additionally, the operator is not fatigued by repeatedly having to stretch to reach around the component, which can weigh up to 100 kg.

Requiring no cables, the portable, manually operated, metrology grade index table is compatible with any make of portable measuring arm, not just LK's 6- and 7-axis FREEDOM arm range, which comprises 34 models. The 300 mm, optionally 500 mm, diameter table is quick to set up on a work surface, after which the operator secures the part to be inspected onto the surface with the aid of pre-drilled, threaded fixing holes or integral clamping magnets.

Similarly rapid is initial calibration of the start position by telling the coordinate system in InnovMetric's PolyWorks | Inspector™ software where the table is. The speed of this procedure is down to clever positioning of randomly placed, alpha-numerically labelled, fiducial dimples machined into the top of the table and around its periphery. By probing three or more of them using the arm, the software recognises the irregular pattern and automatically knows the orientation. It is then a simple matter to click the on-screen FREEDOM Index Table macro in the software to update the coordinate system then continue the part inspection.

When the far side of the part needs to be accessed, the table is rotated through 180 degrees although any intermediate angle is also possible, three or more different reference dimples are probed to update the software as to the new position and measuring continues seamlessly. Both sets of inspection data are aligned automatically by the software. Measurement of geometrical features, evaluation of surfaces using advanced point cloud analysis, part-to-CAD comparison and full reporting in the PolyWorks™ 3D dimensional analysis and quality control software all follow in the usual way.

LK Metrology is renowned for innovative metrology solutions and services. The company's products, including CMM portable measuring arms and metrology software, are used worldwide to control and improve the quality of manufactured components. Its precision technology underpins the process chain from design, development, production and assembly through to quality assurance in global industries such as automotive, aerospace, defence, motorsport, energy, medical and contract inspection.

Established in England in 1963, LK Metrology has an impressive



heritage in metrology dating back to the birth of CMM technology. Founded by CMM pioneer Norman Key and his father-in-law Jim Lowther, LK Metrology is credited with many of the CMM industry's firsts including the first bridge-type design, first OEM to integrate computers, first to use a touch trigger probe, first to develop inspection software, first to use all air bearings and granite guideways, first to use carbon fibre composite spindles, first to use microprocessor-controlled drive systems, first to produce a truly thermally stable CMM and first to produce a high-accuracy horizontal-spindle CMM.

In 2018, LK Metrology was relaunched as an independent CMM manufacturer after several years as a division of Nikon Metrology. Headquartered in the UK, LK's CMM development and production are at the company's facility in Castle Donington. Sales and support offices are located in the UK, North America, Belgium, France, Germany, Italy and China, supplemented by a worldwide distributor network.

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The tool to get just about anything done

New ZEISS T-SCAN hawk 2 is a lightweight, next-generation handheld 3D laser scanner with remarkable ease-of-use

ZEISS has introduced the new ZEISS T-SCAN hawk 2, developed and produced in Germany and certified for the highest industry standards. ZEISS T-SCAN hawk 2 is a portable, reliable tool to capture data with metrology-grade precision wherever needed. This could be in quality control or reverse engineering, maintenance, repair and overhaul.

The new T-SCAN hawk 2 comes with particularly simple and pleasant user guidance. Very intuitive to operate, it adapts easily to the movement of one's hand, features a workflow assistant as well as the possibility to start and navigate the workflow directly. Users can operate the software directly with the system, there is no need to do it via the laptop.

Introducing the new satellite mode and perfect distance control

If users like to go big, the ZEISS T-SCAN hawk 2 is also the right tool for them. It's the first portable laser scanner with the new satellite

mode, allowing users to scan objects up to multiple metres. There is no need for the classical built-in photogrammetry with coded markers and no compromise on accuracy. Another highlight is a red laser marker projected onto the components. This visual aid helps users to keep the perfect working distance while capturing data.

An easy switch between different tasks

Its advanced technology allows ZEISS T-SCAN hawk 2 to deliver high-precision data in any situation and at any moment. Operating with a seamless adjustment for resolution and field of view, it does the job, even in confined spaces or hard-to-reach areas. The same applies to dark or shiny surfaces. ZEISS T-SCAN hawk 2 is strong on a wide range of materials and surfaces, delivering 3D measurement data with the highest precision.

Whatever the job, wherever the job

ZEISS T-SCAN hawk 2 is ready for industries



like automotive, shipping and railway, aerospace or the energy sector. It is also great for mould and machine manufacturing, for example. Indoors or outdoors, the new 3D laser scanner travels in just one case, keeping everything at hand. Moreover, the case contains additional tools like a hyperscale for fast re-calibration or a handy power delivery hub.

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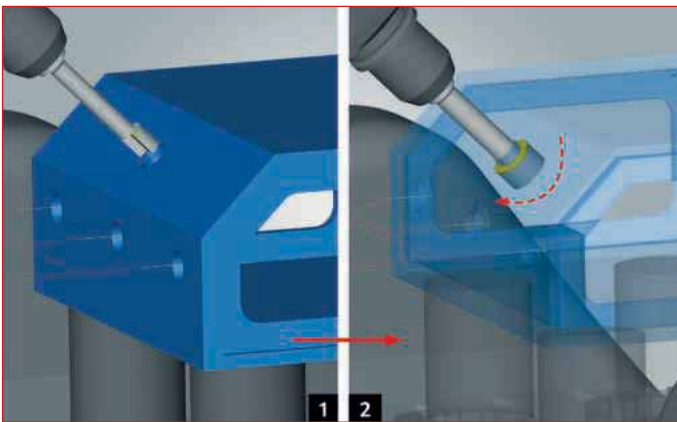
OPEN MIND releases hyperMILL 2023

Load faster, calculate faster and create backbores

The launch of hyperMILL® Release 2023 makes the CAD/CAM suite from OPEN MIND Technologies AG more powerful than ever before and introduces innovative functions. Not only does the software load faster, but the calculation time of tool paths has also been accelerated.

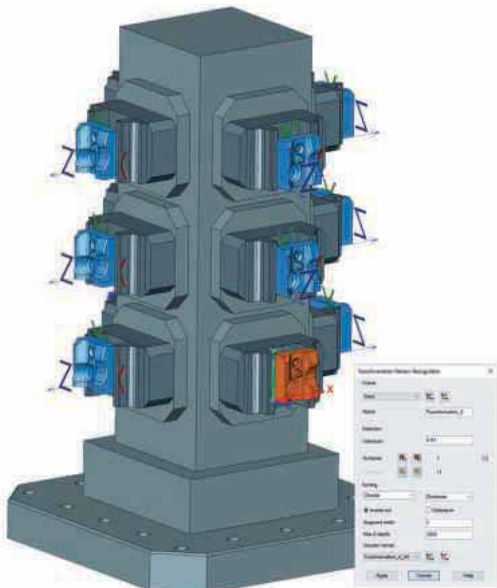
In addition, the 'General Transformation Pattern' function assures that users save time when machining recurring geometries. The new 'back boring' machining strategy attains the highest degree of convenience and safety via its use of VIRTUAL Machining technology.

OPEN MIND has equipped the latest version hyperMILL 2023 with a new machining strategy for back boring. Programming the tools used to deburr and mill a countersink on the inaccessible back side of a hole can now be done with incredible ease. This is credit to collision control that is conducted using a 3D model of the tool in the Virtual Machine. Therefore, potential damage that can be created when inserting and retracting tools is safely avoided.



Automatically transform any function

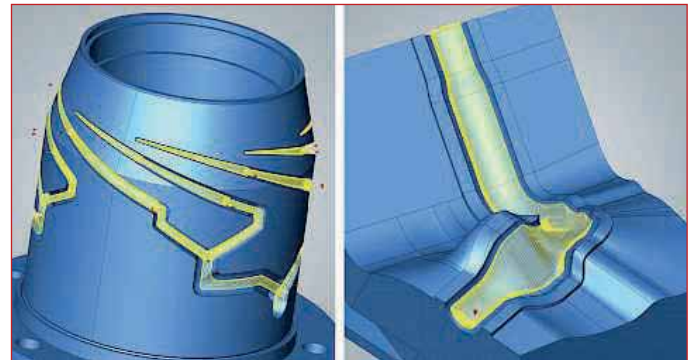
Up to now, standard features such as pockets and holes could be selected automatically. With the 'General Transformation Pattern' function, OPEN MIND now makes it possible to select any reference



geometry and search for that same reference in all other models, regardless of its spatial orientation. This creates a general transformation pattern including a frame at each reference feature. This makes it easy to program recurring shapes with a single click. The function is also suitable for multiple setups.

5-axis strategy for more uniform surfaces

The arrival of the '5-axis Halfpipe Finishing' strategy makes it incredibly convenient to program continuous toolpaths for grooves, tubes and halfpipes with any cross-section along an arched guide curve. This is a great advantage for users, as previously, this machining operation may have needed to be divided into several steps. This strategy opens a wide range of applications, especially in areas such as mould and die where the tool axis points in the de-moulding direction.



CAM in dialog

The example of back boring and its collision control based on a digital twin shows how hyperMILL VIRTUAL Machining is already playing a role in standard functions. Simulation technology based on real NC and machine data is becoming increasingly important. OPEN MIND is driving the necessary communication between CAM system and machine controller forward at pace.

CAD, CAM and data

hyperMILL 2023 not only leverages advances in computing power and software engineering to increase performance, but it also streamlines processes. For example, the hyperMILL SIMULATION Centre loads faster. This is because it does not include unnecessary data for the calculation at hand. The optimised handling of data also provides improvement in other areas. hyperMILL now makes it possible to import individual components from assemblies. Users can now use filters to select individual components when importing assemblies from other design systems' native data. This reduces loading times for large assemblies and eliminates the need to subsequently delete individual parts that are not required.

Another new feature in hyperCAD®-ShyperCAD-S, the CAD part of the software suite tailored to CAM programmers' needs, is the revision of the 'Holes' function. A hole can be composed and parameterised from a library of hole fits, countersinks and hole ends via a dialogue, which includes a preview. To improve graphic clarity, threads can also be displayed if required.

Toolmaker reaps rewards of switching to hyperMILL

When Mark Newcombe had an opportunity to acquire the company that he had worked with for over 15 years, he grabbed it with both hands. Having a clear vision for Plymouth-based Tooltech, the company entered the aerospace industry as a niche manufacturer of wax injection mould tools and ancillary tooling. More than 20 years later, the company has been driven forward at a rapid pace. This trajectory has been directed by investment in the workforce and cutting-edge technology, like the investment in hyperMILL CAM software from OPEN MIND Technologies.

The shop floor at Tooltech consists of machine tools such as AD35L EDM machines from Sodick, 3 to 5-axis machining centres from YCM, Hedelius and Mikron, XYZ turning centres and also 3D printing technology.



Discussing the company, Andrew Newcombe from Tooltech says: "The company began back in 1997 when my dad, Mark, bought the business off his old boss and he developed it into the company that it is today. We produce bespoke tooling for the aerospace and power generation sectors, producing injection moulds and all the fixturing that goes alongside that. Everything we do is one or two off."

The company primarily makes one and two-off components and assemblies and this is exactly why the Devon manufacturer opted for CAM software from OPEN MIND Technologies. Alluding to why the company has transitioned to hyperMILL, Andrew Newcombe continues: "We had a lot of surface finish problems and there were a lot of collisions, which you do not expect from your CAM software. That was the main problem for our business and what we were struggling with, it is also why we looked at other systems and moved to hyperMILL."



"We had a demonstration and it was extremely good, this has been the case since we implemented the software. We have witnessed much better surface finishes on our components and we now have no collisions with our machines. This means that when components come off the machine, there is no secondary hand finishing."

Comparing hyperMILL to the previous CAM software, Andrew Newcombe adds: "With hyperMILL, you have a lot more strategies to choose from and it is also very easy to change from one strategy to another. So, if one strategy isn't the best fit, there is always another strategy to achieve the correct surface finish."

Adding to this, Lance Jobe from Tooltech says: "We were struggling with our previous CAM software and we were finding it difficult to achieve our desired surface finishes. We were also having collisions on the shop floor with our machines and the shop floor staff weren't getting enough information from the sheets that we were putting out to them. We decided to change to hyperMILL after a very successful demonstration in January. We saw some things during that demonstration that covered all of the weaknesses that we were seeing in our current software, so we decided to make the switch."

Referring to the multitude of machine tools and a vast range of cutting tools on the shop floor and how it works in harmony with the shop floor, Andrew Newcombe says: "It was very easy to learn how to set up the tool libraries for our diverse range of machines on the shop floor."

"With entirely new software, training was a daunting prospect but, after three days of training and an additional couple of days playing around with the system, it all clicked into place. We also undertook three days of

advanced training and by the end of that, we were good to go. In just eight days, our business had undertaken a complete transition. During the transition and training stage, OPEN MIND Technologies have always been there and given us the support we have needed. All of the training was done remotely and our training hours were 10am to 4pm, so we could still get work done in the mornings."

"There's a lot less bench work now. The jobs now come off the machines to a much higher standard than what we were getting and there is a lot less secondary work that our guys have to do before the jobs are shipped out of the door. The post-processors were another very straightforward factor. It was one of the biggest concerns we had when changing our CAM software, as we have a lot of different machines in our facility, but it was very simple and straightforward and I cannot fault it."



"hyperMILL is a lot faster to program than our previous software. hyperMILL is so interactive with the model, you can take a lot of the geometries straight from the model and start programming straightaway. There is no legwork at the beginning where you have to create a lot of boundaries and surfaces. The transition over to hyperMILL has been very straightforward and it had minimum impact on our production. Overall, our experience has been fantastic," says Lance Jobe.

Concurring with this, Andrew Newcombe concludes: "We are really happy with hyperMILL. We wish we bought it years ago."

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CGTech celebrates 35th anniversary



CGTech, developer of VERICUT CNC machine simulation software, is proud to celebrate 35 years of growth and innovation in CNC simulation and optimisation in 2023.

“Whether it’s milling, turning, mill-turning or any other CNC-machining, VERICUT® is the industry standard to simulate CNC machines, as well as optimise and verify NC programs,” says Margaret Schmitt, president of CGTech.

“For 35 years, CGTech’s technology leadership and experienced team have helped VERICUT evolve together with our customer base. CGTech’s solutions are deeply entrenched in the aerospace industry’s history and adopted today across industries ranging from oil and gas to Formula 1 racing. People are at the heart of CGTech’s success and have made it what it is today: an innovative software company driven by team spirit and customer care.”

CGTech was founded by Jon Prun in 1988, when he recognised the need to verify NC tool path programs without taking valuable machining time to prove-out a part. VERICUT was the first widely available method to test machine tool paths in a virtual environment. The software has grown to be a leader in the NC program verification space and has since expanded its original capabilities to include physics-based optimisation with its Force module, composites programming and simulation, as well as additive and hybrid processes.

VERICUT is 100 percent developed in-house by software engineers and leaders experienced in manufacturing and the CAD/CAM space. Improvements are made

with each release to support complex multi-axis kinematics, further reduce cycle times, increase tool life, and further optimise the simulation. New features are also continuously being developed, including live CNC machine monitoring features, tool performance optimisation, and more.

“In my 30+ years with CGTech it has been amazing to see this company grow globally, to satisfy even the most demanding NC manufacturing needs. I’m so proud to be part of the abundantly knowledgeable and creative staff at CGTech,” says Gene Granata, director of product management. “Together, we truly enjoy applying our collective experience supporting our valued customers, helping them be more competitive and create parts as efficiently and safely as possible.”

Headquartered in Irvine, California, CGTech has offices located in the UK, France, Germany, Italy, Japan, China, Singapore, India, Brazil, and Korea to support customers located around the globe in virtually every manufacturing industry. CGTech hosts local VERICUT User Exchange (VUE) meetings annually across the globe to connect with customers to support their growth and needs.

“VERICUT protects our machines from damage due to collisions and gives both the programmer and the machine operator a feeling of safety in their daily work,” says Werner G., CAM system consultant at MAN Energy Solutions. “It reduces strain on resources on the shop floor through shorter run times and less machine downtime.

Wishing CGTech all the best for the 35th anniversary. Keep it up!”

CGTech is committed to strengthening its offers in verification and optimisation, as well as extending upstream to post-processing through the recent addition of ICAM Technologies Corporation to Sandvik and downstream to connectivity using real-world machining data and performance.

CGTech is thankful for the continued support of its customers, from those who have just purchased the software to those who have been using VERICUT since its first version. The company will continue to build its value proposition for customers across the digital manufacturing workflow.

CGTech’s VERICUT software is the standard for CNC simulation, verification, optimisation, analysis and additive manufacturing. CGTech also offers programming and simulation software for composites automated fibre-placement, tape-laying and drilling/fastening CNC machines. VERICUT software is used by companies of different sizes in all industries. Established in 1988 and headquartered in Irvine, California.

CGTech has an extensive network of offices and resellers throughout the world. For more information, visit the CGTech website.

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New digital manufacturing software from Moduleworks

ModuleWorks has announced the latest release of its digital manufacturing software components with new and enhanced features across the company's entire CAD/CAM and CNC portfolio, including a new deburring preview, new cycles for rotary and turn milling, multi-regions for fused deposition modelling and simulation and post processing for U-Axis turning operations.

Preview of deburring curves

For multi-axis subtractive machining, there is a new option to preview the automatically detected deburr edges before calculating the toolpath. Users can also include/exclude drive curves in/from the toolpath calculation to speed up programming.



Floor finishing for rotary machining

The rotary machining component now offers floor finishing cycle to complete the ModuleWorks basic finishing portfolio of wall and floor finishing.

In addition, users can now use the cusp height to adjust the stepover on rotary and turn milling operations. It works for all supported tools and incorporates the axis offset to eliminate complex manual calculations.



Simulation of U-axis turning

The ModuleWorks Machine Simulation now supports U-axis turning where the part is static and the turning tool is mounted on the spindle and rotates around the workpiece. The Machine Simulation now also includes flexible machine components such as cables or elastic bellows that are used as machine covers. These components are attached to a fixed point and connect to a movable component.



For the Cutting Simulation, enhanced triangulation algorithms accelerate the generation of the simulation model. This also speeds up mesh export which significantly enhances the performance of stock management where the stock is exported after each operation.

Assign different properties to different deposition regions

With this new feature for fused deposition modelling, users can divide a work-piece into separate regions and apply different settings to the layers, walls and infills in each region. This adds manufacturing versatility and enables operators to enhance the quality of the final product, for example by applying different infill densities to different regions to compensate for forces/pressures.

Post processing for U-axis turning systems

The ModuleWorks MultiXPost post processor now supports U-Axis turning systems, also known as facing head or facing slide kinematics. The input is a turning toolpath. Markers on the toolpath indicate when to engage the special translation axis. This creates an operation where the machine first travels above the workpiece and then, using the U-Axis instead of the other translation axis, cuts the desired shape in turning mode.

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Mastercam software milling features

As a programmer becomes more adept and confident with their software, the focus may shift from simply turning out programs quickly to finding the most efficient, refined approach to cutting. This is where advanced milling techniques come into play. By applying advanced technologies to routine parts, programmers can halve cycle times, save excess material and lengthen tool life. This idea was the inspiration for many of the latest features in Mastercam 2023.

Detect undercut stock during machining

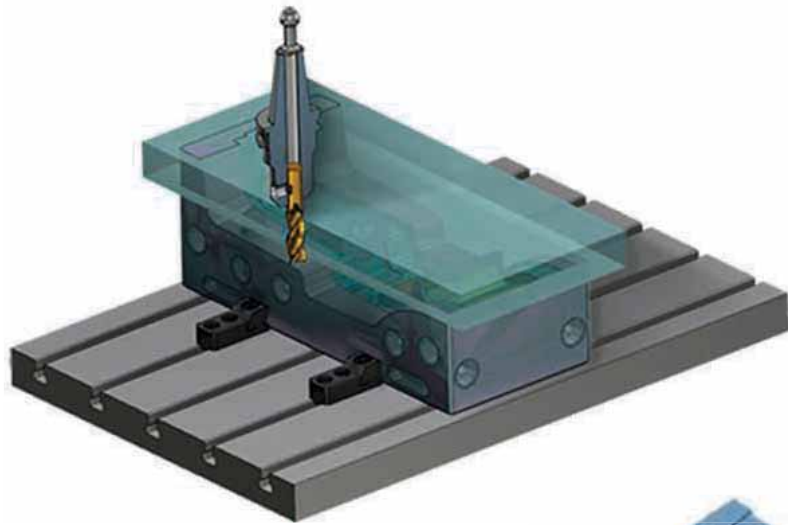
Users can now enable their Mastercam software to detect undercut stock conditions when they use Dynamic OptiRough and Area Roughing toolpaths. With this feature enabled, the software will automatically check for undercuts and adjust roughing accordingly, significantly reducing air cuts. Use this feature when a complex part has “hidden” undercuts that otherwise would require major time and painstaking coding to program.

Identify and machine material in corners

The same style of thinking that developed the undercut detection feature also made it possible for the Equal Scallop toolpath to identify leftover material in corners. The software will now detect this material and adjust machining so that the excess is removed in one or multiple passes, ensuring a smooth transition into the rest of the part. Programmers can specifically define the step ins, distance, amount of material removed in each step and maximum number of step ins. Although this feature creates relatively smooth transitions, it is only considered a semi-finishing application. Users are encouraged to complete their part with true finishing passes afterward.

Create automatic boundaries for toolpath containment

The Automatic Boundary feature creates a containment boundary around a selected machining geometry for 3D high speed toolpaths. There are four options from which to choose: None, Silhouette, uses the geometry’s silhouette as a boundary, Bounding rectangle and Bounding circle. The Include Stock option carries over the stock settings and applies them to the boundary.



Machine with ZigZag motion

Closed Contour Direction and Open Contour Direction drop-downs have replaced the old Cut Method drop-down within Area Roughing’s Cut Parameters page. They allow for more customisation and more optimised cutting. One such cutting method is Zigzag, an option in Open Contour Direction. With Zigzag, each successive cut moves in the opposite direction of the cut directly preceding it. The motion can save time in many milling applications.



Add stock awareness to Holder Checking

With Mastercam 2023, all portions of the stock model outside of the containment boundary are checked for collisions on Dynamic OptiRough, Area Roughing and Horizontal Area toolpaths when Collision Checking is enabled on the holder page. Rest Material must be enabled on the Stock page for this to work.

Reading about these techniques is one thing, but applying them is something else entirely. As you experiment, remember to keep your certified Mastercam Reseller close for troubleshooting and to answer questions. They are your best source for explaining any new Mastercam tool.

Mastercam provides solutions for designers and NC programmers around the world, in a spectrum of applications including

2- through 5-axis routing, milling and turning; 2- and 4-axis wire EDM; 2D and 3D design and drafting; surface and solid modeling; artistic relief cutting; and Mill-Turn. Customers range from one-person job shops to Fortune 100 manufacturers. With Mastercam, the same software that is used by corporations such as Boeing, IBM and Sikorsky is still affordable enough for the small job shop. To ensure an ongoing supply of trained programmers and machinists, Mastercam is available to educational institutions at sizable discounts.

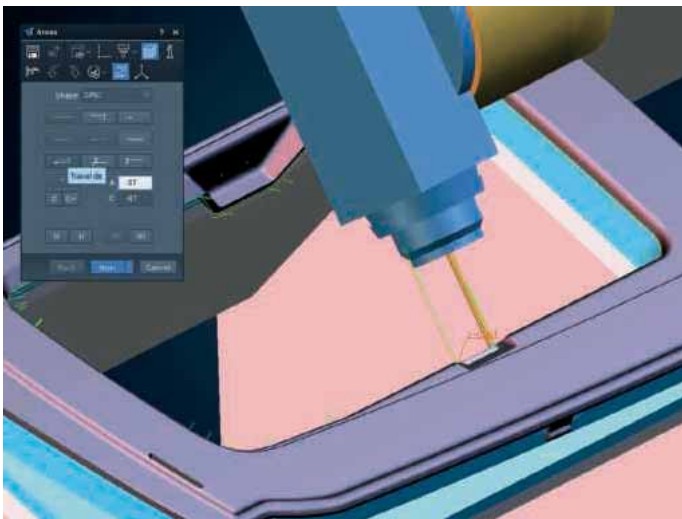
As its flagship product continues to grow and expand into new markets and technology, the company’s focus remains on its customers. CNC Software is committed to delivering solutions that support higher productivity and greater precision for the wide-ranging needs of manufacturing.

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CAD/CAM for trimming, machining and laser cutting

Tebis is a leader in CAD/CAM and MES technology with vast experience serving customers in many industries including model, pattern, die and mould making as well as component manufacturing. One of Tebis unique offerings is Tebis specialist 5-axis mill trimming and laser cutting package for improved machining operation safety, quality and efficiency as well as ease-of-use. Its trimming package has been widely used for moulded plastic parts, composite components and other material parts.



Optimise for machine safety

Having a variety of tools that can accurately and concisely adjust tool directions means that Tebis has full control of the machine head, even during the programming process by way of its virtual machine technology. This is particularly important with a typical asymmetric head configuration on a trimming machine, where a lack of control of which side of the asymmetric head is being used can lead to catastrophic collisions.

Toolpath correction

Tebis can correct and modify an existing toolpath easily with just the addition of the modified geometry. It has the facility to import an extra piece of geometry, such as a curve and add this into the toolpath. So you don't need to modify any other CAD data or even reprogram the operation, just open the toolpath operation and add the extra geometry and Tebis will take care of the rest for you.

Automation in trimming

Using programming templates, Tebis is able to give absolutely consistent tool paths and cutting conditions by predefining the parameters. This ensures that all output NC programs are using the same stepovers, lead ins/outs and safety clearance.

Full collision avoidance

Safety is critical in all areas of machining, especially for 5-axis machining. Tebis collision avoidance is working in the background at all stages of the programming process. Tebis checks the spindle and

machine head, toolholder and cutting tool against the finished component and fixtures. It is also able to control all machine movements, including movements and links between toolpaths. Therefore, the software is able to have total control over all potential collisions thus, safeguarding the part, tooling and machine tool.

Reverse postprocessing, importing historical programs

Tebis can import old teach and learn programs or even old CAM generated programs. This allows you to adapt historical programs from an old machine to a new machine and even modify and optimise old teach and learn programs for modified components.

Specialist fixture design for trimming operations, saving fixture design CAD work time

Trimming operations are usually for small batch parts and fixtures need to be designed to hold the parts. Tebis offers specialist trimming fixture CAD design tools to efficiently design trimming fixtures with ease, saving a lot of fixture design CAD work time.

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Machine and software automation doubles capacity at LNS UK

Investment in a new automated laser cutting system and associated software has doubled manufacturing capacity for swarf management systems produced by LNS Turbo's factory in Wombwell, near Barnsley. This has the company to continue its strategy of targeting OEMs and dealers rather than end users.

The £850,000 investment includes a 4 kW LVD Phoenix fibre laser with a 10 station Compact Tower automation system for blank sheets and finished parts. Also included in the package is a 4 m 135 tonne LVD Easy-Form press brake and LVD's CADMAN software suite.

These latest machines join an existing LVD Easy-Form press brake, which has been upgraded to be fully compatible with the latest software, as well as a small LVD Dyna-Press electric press brake.

Mark Scanlan, the European chief operating officer at LNS, first visited LVD in Belgium five years ago and realised how its technology could transform manufacturing at LNS UK.

He explains: "I went to look at the equipment but immediately saw the software could give me another level of automation. When people talk about automation, they tend to talk about the machine tool, but LVD has a whole suite of software that makes our engineers' job easier.

"This means they can automate the process of taking a 3D model, creating a 2D pattern, putting that through a CAD/CAM system and making a verified component that will be right first time. That was a big driver for the investment."

"We got our first LVD press brake seven years ago and post-Covid we bought an LVD Dyna-Press, which is great for small parts. But I had always been pushing for the LVD laser with autochanger and a second press brake and all the associated software to really automate the complete process."

The new investment coincided with a change of ownership of the LNS group which is now part of Swedish investment group Storskogen and a new market focus.

This has changed the strategy from making one-off machines for end users to targeting machine tool OEMs and dealers where it could achieve economies of scale and this required it to ramp up its manufacturing capacity.

As Mark Scanlan explains: "We have changed our market focus from making machines per order for end users, to partnering with OEMs where you are focused on making higher volumes of similar types of



equipment. To meet that demand for volume manufacturing we wanted to automate not just the physical manufacturing process but also the software behind it.

"With the new LVD laser and software everything is now focused on mass production but with a high degree of variability. The Phoenix with the 10-station tower storing sheet and finished parts gives us the ability to work lights-out.

"The whole laser package has enabled me to more than double my overall capacity from 240 machines a month to 500. The second press brake helps me to bend more parts, but the laser was the key."

"The capacity increase was really important as it will enable us to have a greater presence in the OEM market. But it was not just about capacity, it was also about upskilling people within the business.

Mark Scanlan continues: "The focus now is that the team will eventually be multi-skilled. They will be able to operate the laser and operate the press brakes because the touch screens are very similar. We are going to change how the overall department works."

The skills issue also comes into play with the Easy-Form press brakes. Mark Scanlan adds: "Skills are not abundant in the labour market, so we are training people to operate that machinery from scratch. So, the EasyForm angle measuring technology is a great help.

Automating the software process from 3D design to finished part was vital to be able to cope with the high product mix that was now required.

Mark Scanlan states: "If we sell 200 machines in a month there could be 160 variants. If a customer places an order for 80 units, it could be spread across eight different models with only 25 of them the same.

"Dealers will sell multiples of the same machine in a year and once we have the design and it is in our system it is easy for us to just pull that design out, call off the laser patterns and make it. But every week we get new variants where we need to program a new part and that is where the software automation comes in."

On the production side, most of the material being processed is from 2.0 to 3.0 mm, although the laser can cut up to 20 mm. The cut 2D parts are then formed and welded to create the machine frame. Although it is thin material, it is a very robust and strong product once it has been fabricated.



The accuracy of the EasyForm press brake ensures accurate fit up of the formed parts for welding. As well as structural components, the laser cut nest will also include smaller parts such as legs, covers, brackets and so on.

Mark Scanlan says: "A lot of what we are manufacturing is for small components, but some of the machines we build are 10 m long, the biggest we ever made was 25 m long, so we use 3 m sheets and bolt the fabricated sections together if we need to."

Wombwell is LNS's European manufacturing centre for swarf management equipment, with 60 percent of production destined for the UK and 40 percent for export to Europe. Other machine tool peripherals in the LNS portfolio, such as bar feeders and air filtration systems, are manufactured at sites in Switzerland and Italy.

Mark Scanlan explains that as COO for Europe he will be taking an overall view of manufacturing processes across the sites: "The sheet metal work for the products manufactured in Italy and Switzerland is all subcontracted. One of the questions is whether we could bring that in-house."

He adds that LNS in China also has an LVD laser with Compact Tower



system and a LVD Robotic Dyna-cell installed and followed from the lead of the UK operation: "We were the ones that started the LVD process, that's where we wanted to go. We saw the power of what it could do for us. After I had been to Belgium, the person who runs the facility in China came over and went to LVD in Belgium and saw the opportunity."

Mark Scanlan concludes: "It puts us ahead of our competition in terms of lead time. We have two customers who we guarantee a 10-day turnaround from point of order to delivery. Our competition doesn't offer that service and we have won all the work from a major UK supplier on that basis."

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Shaping flows.



Regaining efficiency with artificial vision and automation

The Salvagnini L3 is a productive and versatile fibre laser, with reduced consumption and competitive running costs, designed for transversal use regardless of application, material and thickness, as it is equipped with a single laser head which allows all workable thicknesses and materials to be cut.

“The L3 is an agile laser,” explains Pierandrea Bello, Salvagnini product manager for laser technologies. “Its numerous proprietary functions, the FACE human-machine interface and the artificial vision systems help operators to effortlessly solve any problems in their day-to-day work. It is the perfect response to market trends which have contributed to redefining the laser cutting scenario: regaining autonomy and efficiency on the one hand and reducing running costs on the other.”

When we discuss regaining autonomy and efficiency, we have to talk about automation and artificial vision applications. Salvagnini's range of laser automation is extensive and modular: store towers or tray stores, different loading/unloading solutions, automatic or manual sorting devices. At the Lamiera exhibition it will also be officially unveiling the ADC, a new compact automation for sheet metal loading and unloading which will further expand the range with a compact solution. Its strengths, in addition to its compact footprint, are rapid cycle times and fast installation. ADC, like all our automations, also uses a comb unloading device featuring a set of belts; these slide the sheet metal slowly when depositing it, substantially reducing the risk of damaging the material or the cut parts.

In order to further simplify some activities which are potentially time-consuming or could generate errors or waste and therefore reduce the overall efficiency of the system, Salvagnini's lasers can also be equipped with a number of artificial vision applications. These are simple solutions that increase the flexibility of the system and broaden its field of application. AVS turns laser cutting into a work station downstream of punching, thus guaranteeing the maximum precision of the cut parts. Nozzle Vision System (NVS) checks that the laser beam is centred and uses the machine learning algorithms to monitor the state of the nozzle and reduce waste. SVS recovers scrap and sheet metal leftovers, responding to urgent needs or replacing any waste in downstream machining activities.

Another interesting new feature of SVS is an additional sheet-alignment functionality as an alternative to the capacitive sensor or AVS. In alignment with a capacitive sensor, the laser head must position itself in the traditional three points and carry out measurement. Measurement with AVS is faster because there are only two points to be checked, while with this new SVS version you can eliminate the measurements because alignment occurs immediately after the pallet change via the SVS cameras, without requiring any movements of the head. The sheet metal is loaded into the machine and the SVS cameras identify the starting format with the same measurement precision as the capacitive sensor. It is not a new option, but rather an update of an option already



available which can now do something more: it not only allows recovery of scrap and leftovers, but also reduces the cycle time by eliminating alignment without sacrificing precision.”

Reducing operating costs: cutting with compressed air and software

As regards to reductions in running costs, the growth in fibre sources has revolutionised the hourly cost of laser systems. Their high level of efficiency has drastically reduced energy consumption, while the intrinsic features have reduced the costs of routine and extraordinary maintenance. The faster cutting speed has also allowed processing times and, therefore, the cost per part to be reduced.

The cost of the gas had instead remained unchanged. The L3 is natively set up for cutting with nitrogen and oxygen, but to reduce running costs, Salvagnini has also introduced the ACUT option, which allows its lasers to cut with suitably treated compressed air. Cutting with compressed air is cheaper than with nitrogen, all the more so when the cost per m³ of nitrogen increases: the higher the cost of nitrogen, the more cost-effective cutting with compressed air becomes. Productivity is very similar, while the quality depends on the application



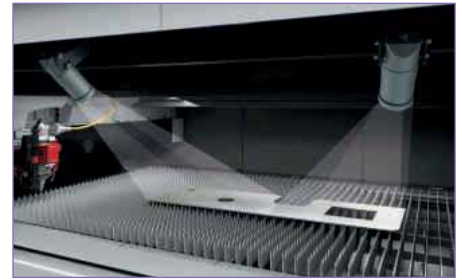
feedback indicates that cutting with compressed air is gaining ever-greater acceptance. ACUT has evolved rapidly: today, depending on the source power, it is possible to cut thicknesses of up to 20 mm with compressed air. This also explains the choice to introduce a 10 kW source, allowing very thick material to be cut while reducing the dependence on nitrogen. But Salvagnini's third-generation laser head has also contributed to this result, as it is ideal for high power sources."

It is a single laser head which allows cutting of all workable thicknesses and materials and which contributes to improving the efficiency of the laser thanks to the advanced set of sensors it is equipped with. The patented DRY-COOLING system actively controls the temperature of the optics, while its process sensors monitor and adapt piercing in real time, monitoring any cutting losses, stopping the process and restarting it with suitably corrected parameters. The TRADJUST function, integrated into the proprietary control, ensures automatic parameter modulation in accordance with the trajectories, making the system easier to use.

On the subject of cutting with compressed air, we really can't leave the APM option out of the discussion. It is a compact, turnkey device, which connects directly to the factory's pneumatic supply or to a compressor upstream of the system. APM normalises the pressure, filtering and drying values of the compressed air, optimising it for air cutting and eliminating the costs for dedicated compressors. Considering the current cost of gas, the break-even point for the ACUT and APM options is less than one year. Thereafter, the savings are considerable."

But a positive impact can also be seen on daily work, because reducing gas consumption also means reducing the number of supplies. This means lower transportation and fixed costs, as well as reduced entropy in the workshop.

Pierandrea Bello concludes: "Software can also make a contribution to reducing operating costs. Our dedicated cutting program software is called STREAMLASER and it is part of our STREAM programming suite. In addition to functions we consider standard, such as automatic definition of



lead-ins, cutting sequences and nesting, which the programmer can modify interactively, it also has distinctive features designed specifically to improve the efficiency of the material and thus reduce costs. SAFE GRID automatically optimises the positioning of the parts with respect to the grid, preventing piercing operations, lead-ins and cuts from overlapping on the Y-axis. SAFE GRID reduces wear on grids and maintenance costs, but also improves the quality of processing and the reliability of the laser.

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Unison and Nukon lasers help access equipment maker reach new heights



Redditch-based access equipment maker, Redhill Manufacturing, has purchased two British-built all-electric tube bending machines from Unison Ltd and two fibre laser cutting machines from Unison's sister company, Nukon Lasers UK. The new machines will be used by Redhill to meet increased demand for its products, with one of the tube benders replacing a machine that was lost in a factory fire in May 2022.

The first of the new fibre lasers, a Nukon ECO 315 4kW flat sheet metal machine, was installed at Redhill's newly acquired facility in December 2022. The second laser, a Nukon NKT-125 2kW 3D tube cutting model and the two Unison tube bending machines, both 30 mm tube diameter single stack models, will be installed later in 2023. Combined, the value of the four machines is in excess of £1 million.

Following the fire at its original manufacturing site, Redhill wasn't simply faced with finding new premises. The Redditch business also needed quality CNC machine tools to maintain its standing as the only UK manufacturer of 'kitemarked' British Standard mobile safety steps.

"Incredibly, we were up and running again in just three weeks following the fire," comments Redhill's managing director, Andy Colley.

"With temporary accommodation secured until we could move into our new manufacturing facility in winter 2022 and the insurance settled, we basically needed to source new tube bending machinery and quickly. This was because only one of our existing benders had survived the fire. It also seemed appropriate to end our reliance on outsourced laser-cut parts by investing in our

own flat sheet and laser tube cutting capability."

Free loan of tube bending machine

"I'd read good things about Unison's range of all-electric 'Breeze' tube bending machines, so got in touch with them with a view to ordering two machines; one to replace the machine we'd lost and a second for additional capacity," adds Andy Colley. "As it would be several months before the new bending machines were ready, Unison kindly offered to lend us one of their showroom models. This was just what we needed to tide us over until the new tube benders were built."

It was during a meeting with Unison's key account manager, Steve Haddrell, to discuss the specification of Redhill Manufacturing's two new all-electric Breeze tube benders that the conversation turned to laser cutting.

"I obviously had a requirement for two fibre laser machines but wasn't aware that Unison's sister company had recently become the UK and Ireland distributor for the Nukon laser range," says Andy Colley. "As I didn't really know the Nukon brand, Steve Haddrell arranged to take me to a company in Sheffield that had been using a Nukon flat sheet metal laser for around a year so I could see the machine in action and chat to the operators about their experience of using it."

"If it's good enough for Unison"

Hearing glowing reports of how the Nukon flat sheet metal laser had streamlined the process of cutting complex precision components at the Sheffield business, Andy Colley then travelled to Nukon's European manufacturing facility to see a Nukon tube laser machine in action. "The tube laser machine was just as impressive as the machine I'd seen in Sheffield," he confirms. "The build quality was very good. Both machines were competitively priced and the features included nLIGHT fibre lasers with adaptive beam optimisation and Lantek Expert nesting software. What really gave me the confidence to place an order, however,

was my belief that if Unison was happy to be associated with Nukon, there was absolutely no need for me to be concerned about machine quality or aftersales support. They were a given."

Redhill Manufacturing chose the Nukon ECO 315 4 kW, 3,050 mm x 1,530 mm flat sheet metal fibre laser for its ability to cut complex shapes and pieces with speed and precision supported by fast, easy programming, an essential requirement for a business dealing with small batch runs. Similarly, the Nukon NKT-125 2kW 3D tube laser machine was selected for its speed, easy programming and exceptional versatility whether cutting pipe of round, oval, square or rectangular profile. The machine will also be supplied with a fully automatic Nukon 8 m loading and unloading system.

Redhill's two new 30 mm Unison Breeze single stack tube bending machines will be used in the manufacture of its British Standard, BS EN 131-7, kitemarked steps; mobile steps, portable steps and other access equipment. All Unison Breeze machines offer rapid setup, fast tooling changes, exceptional power, rigid mechanical design and all-electric control for right-first-time repeat

subcontract work or immediately after producing a single trial part.

"The installation of our Nukon ECO flat sheet metal laser was smooth and straightforward," adds Andy Colley. "While thanks to the machine's easy setup and the thorough training provided by the Nukon Lasers UK team, we were successfully cutting components almost immediately. This benefit gave us excellent quality control and allowed us to stop outsourcing laser cutting. We're now looking forward to the arrival of our second Nukon laser and the Unison tube benders in the next few months."

"It was a pleasure to assist Redhill Manufacturing in upscaling its manufacturing capability and replacing the equipment lost in the fire," comments Unison's Steve Haddrell. "When we heard how the business had lost one of its tube benders, we simply had to help out with a loan machine."

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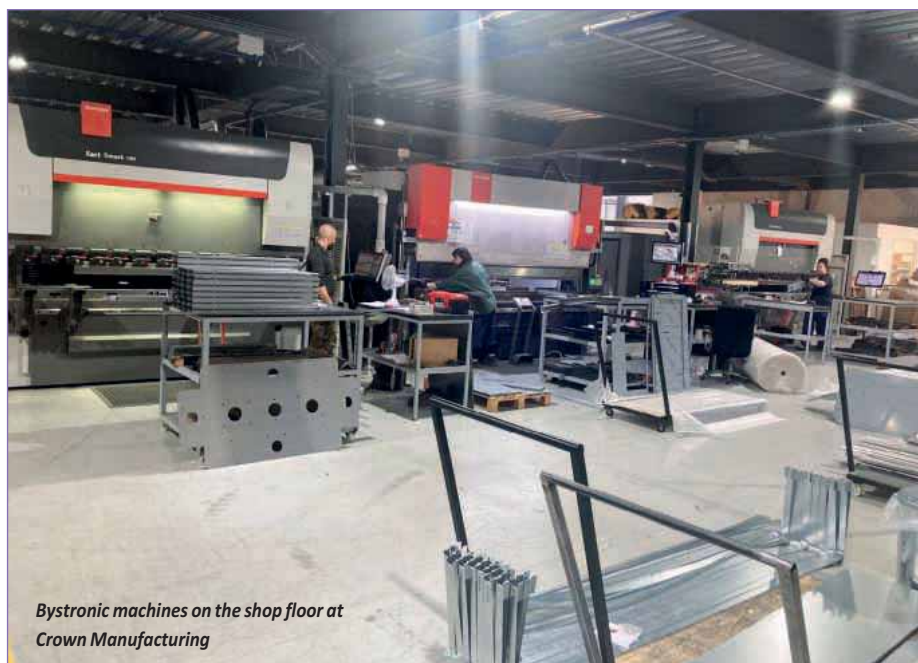
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Bystronic provides some retail therapy for Crown

Founded in the late 1990s, Crown Manufacturing has evolved into a true manufacturing success story, overcoming adversity and growing to become a business with a presence on two locations with a team of over 60 staff. Bystronic has travelled this journey with Crown Manufacturing almost since its inception.

As a leading provider of high-quality sheet metal and general metal fabrication products and services, the journey for the Weston-Super-Mare manufacturer started when an engineer took a passion for Italian Lambretta scooters and took it to a multi-million-pound company. The company evolved from the production of scooter components to 'fit outs' for the retail industry.

Paul Read from Crown Manufacturing says: "We started in the late 1990s manufacturing Lambretta parts, which was a hobby and passion of our MD, Dean Harvey and evolved into a business. Now, we manufacture for the retail industry, producing all the fixtures and fittings that are going into a store. We design and produce everything that is hung on a wall and on the mid-floor. Processing sheet metal work that is flat, we have to laser cut, fold and bend it; and in some instances, parts move from folding to our welding area for fabrication work or our paint shop for finishing and subsequent assembly. Ultimately, we start with flat metal sheets



Bystronic machines on the shop floor at Crown Manufacturing

and finish with a complete assembly or product."

As the Somerset manufacturer has evolved, so has the skill set and services. The company now offers everything from design engineering to tube and flatbed laser, folding and forming, fabrication & welding, painting and powder coating, joinery and panel work and more. To arrive at a point where the company can provide a complete solution

without reliance on subcontract vendors, Crown Manufacturing has invested heavily in both its staff and technology. As Paul Read continues: "We found that being dependent on third-party suppliers wasn't going to enable us to react in every area, to service our customers. So, over the years we have invested to try and bring all the services in-house. Our investment in the last year has been useful to close off that dependency on third-party manufacturers."

The ongoing investment strategy has seen Crown Manufacturing invest in fibre laser cutting for both sheet and tube materials as well as investment in bending and forming equipment.

"Another passion of our business is the Ford Willys Jeep and we now have a website: www.joesmotorpool.com that is all about the refurbishment and restoration of Ford Willys Jeeps. We produce all of the panel work, to full restoration bodies and full restoration Jeeps from each part to the complete Jeep."

A disaster struck the business in 2018 when a fire caught hold of the paint department, creating catastrophic damage to the business. Recalling this, Paul Read says: "On the day before my birthday in September, we had a disaster that would ruin most companies. We had a fire, a malfunction in our paint shop. One of the benefits of having



Sales manager Gary Powell, Bystronic UK and Paul Read from Crown Manufacturing

great relationships with our clients was that they knew we were committed to them as a manufacturer. So, even with the disaster of the fire and having to reduce our staff after losing 50 percent of our factory, they could see that we were determined to deliver on our promises. The commitment of our customers to us was paralleled by our commitment to them. Now, with the support of our customers and suppliers, we have got back to where we were and exceeded it."

One thing that the fire did provide, was an opportunity to review processes, workflow and production equipment. As Paul Read continues: "The fire was something that most companies would struggle to recover from. However, we have some excellent relationships and we had some great support from our customers and suppliers and, after the event, this was coming back to us. Our customers and suppliers could see that if we could build from the disaster, they would build with us and support us. The commitment from the clients was matched by our commitment to the clients."

"The fire also gave us the realisation that we could work smarter with the people and suppliers that we have. Now, we have our in-house development teams with software

and apps that make all the processes across the whole business run smoother."

Looking at the relationship with Bystronic, Paul Read says: "Sheet metalwork was always historically done in the 2D world because it comes in flat and we form it. By bringing this into the 3D world, we have evolved nicely and the fire was the catalyst that brought that to light along with the new machines that we have invested in since that period as 3D now exists on the machines as well. We can now create 3D models and send them through to the machines. The transfer straight from PC to machine is now a reality and something that Bystronic has supported us with."

Since the fire, Crown Manufacturing has invested in three machines from Bystronic and the plant list now includes the fibre laser with automation that can load up to six tonnes of steel, an Xpert Pro100t 3m, 3 x Xact Smart 100t 3m and an Xpert 40. This high-end plant list is complemented by CAD/CAM systems such as Autodesk Inventor; Radan, Alphacam and Bystronic's Bysoft suite that enables Crown to seamlessly take customers through from concept and design to finished product.

The latest acquisition that arrived in 2022 was the Bystronic ByTube 130. This machine

features a fully automatic setup, bundle loading, 6-axis control and high-speed and precision cutting that allows Crown Manufacturing to take on and efficiently complete high-quantity orders to a very high standard. Paul Read says: "Our latest investment is the tube laser. This takes away the dependency upon a third-party supplier that we did end up struggling with. Integrating the ByTube 130 into Crown's arsenal of machinery has been revolutionary, as it removes bottlenecks in the manufacturing process by allowing us to schedule and prioritise tube laser work in-line with due dates and urgency."

In conclusion, Paul Read says: "The passion for Lambretta scooters is what really started Crown Manufacturing. Our business grew from that to producing for the retail industry and, as much as the fire was a disaster, we bounced out of that to create far more productivity from being better organised. Having a new factory layout will help us to move onto the next level."

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From material supply to custom-cut parts

Waterjet cutting is a versatile technology that has been used in many industries for decades, but its capabilities are constantly evolving. In recent years, advances in waterjet cutting have opened up new possibilities for aerospace and defence applications.

Waterjets can be used to cut complex shapes with high precision and accuracy. thyssenkrupp Materials UK, a leading material supplier and supply chain solutions provider, has one of the largest waterjet cutting facilities in Europe and is located in Darton, South Yorkshire. The site has some of the most advanced flat product cutting facilities in the supply chain industry, including routing, guillotining and deburring. However, its unrivalled expertise lies with the nine state-of-the-art waterjet cutting machines, which can easily accommodate hard materials of up to 12 m in length. Now, thyssenkrupp Materials UK has also unveiled its brand new laser cutting capabilities which are all housed under one roof onsite.

What thyssenkrupp Materials UK specialises in is the supply of high-quality materials such as aluminium, stainless steel, mild steel, titanium, nickel alloys and composites. The company serves the aerospace and defence industry, which is one of the most complex and demanding industries when it comes to supply chain management. To ensure competitive performance, an effective strategy must be implemented that takes into account all aspects of the supply chain from material acquisition to logistics, production and efficiency. Therefore, the company has recently adopted a new strategic path called “Materials as a Service” as part of its holding organisation thyssenkrupp Materials Services. This allows manufacturers to focus on their core business and utilise the expertise of thyssenkrupp Materials UK in managing their material supply, delivering added value services in preparation of the finished product and overseeing subcontractors and logistics.

The facility in Darton lives up to the “Materials as a Service” strategy and offers an all-around service to its customers, with additional capabilities such as the new laser cutting machine and a 5-axis cutting head on the waterjet machines. This provides the ability not only to precision cut without any change in the material intrinsic properties due to heat generation but also to cut on angles and corners.

As waterjet cutting offers a high yield of material through closer nesting of parts, thyssenkrupp Materials UK offers an optional nesting service, allowing the nesting of multiple shapes together and cutting them with multiple heads. The team can track sheet remnants and nest parts onto any odd shapes to help save valuable material and



provide waste efficiencies. With sustainability being the main focus at thyssenkrupp Materials UK, the site not only helps its customers to produce the most efficient products but has also adopted a continuous improvement culture to build upon its own efficiencies through various projects, such as custom racking for off-cut material.

David Ascroft, general manager at thyssenkrupp Materials UK, says: “We consider sustainability in everything we do. Material supply is a critical component in any aerospace or defence project, as quality control requirements are extremely high. With our material being of the highest quality standard, we take great care of each aspect of operations and warehousing at our sites. For example, our maintenance team has built bespoke racking for off-cut sheet material. It allows us to safely store various and irregular sheet size to fully utilise all the material and allow it to be reused. With projects like this, our teams at Darton drive forward the 6S continuous improvement focus and apply it daily to ensure the best for our customers.”

To offer flexible production runs to customers and deliver products with superior speed and cost efficiency, the business has further invested in additional laser cutting capabilities. The laser cutting machine systems are boosting the site’s output and ensuring high quality and increased productivity, as well as reduced energy consumption during operation, which helps enhance the sustainability efforts within the company. Adding the routing capabilities as well, thyssenkrupp Materials UK in Darton offers specialist expertise in the materials industry to support aerospace manufacturers with custom, added value solutions based on their specific parts and products. All the available capabilities at thyssenkrupp Materials UK – Darton allows it to provide the right cutting solution to customers and streamline the complex supply chain.

The wide range of capabilities and expert engineering support make the company the preferred supplier to the aerospace industry, serving major OEMs, Tier 1 and Tier 2 manufacturers with products for



aerostructures and aero engines. The waterjet machines at thyssenkrupp Materials UK – Darton are also used for near-net shapes before the last-stage CNC machining of commercial airframe parts.

David Ascroft explains: “With manufacturers from the aerospace and defence industry struggling to find a reliable material supply and a partner who understands their needs and can deliver the required quality, we believe that our service can support the industry flexibly and sustainably. By being part of one of the global materials and processing leaders, thyssenkrupp Materials Services, we create partnerships with our customers and offer the much-needed flexibility that aerospace manufacturing needs at the moment.”

thyssenkrupp Materials UK – Darton is looking forward to what the year ahead will bring, as the site supports the rising demand in the aerospace industry to move materials and parts from its factory in South Yorkshire into assembly facilities around the world quickly yet



cost-effectively without compromising on quality. Additionally, operational efficiency will always remain a priority throughout all stages, especially when dealing with multi-site global networks and just-in-time deliveries.

thyssenkrupp Materials UK has extensive knowledge and years of experience in supporting the aerospace & defence industry. The company stocks and supplies a vast range of materials, including aluminium, steel and titanium in all forms from plate, sheet, bar and tube to custom parts. It provides world-class in-house capabilities offering technical services such as material cutting and machining to developments in automation, supply chain management and 3PL/4PL solutions.

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New TRUMPF panel bender is shape of things to come at Metalline

Metalline, a leading UK manufacturer of architectural metalwork solutions, has invested in a fully automated TRUMPF TruBend Center 7030. The machine, the first panel bender on site, is providing three times the throughput speed of the company's press brakes and is helping this progressive business to continue its impressive growth trajectory.

With over 30 years of experience and an enviable reputation nationwide, Metalline relies on its highly skilled workforce and its state-of-the-art manufacturing equipment to deliver products on time and to exact specification. Architects and contractors specify the Cannock-based company's fabrications on a wide range of prestigious construction projects across the UK. Metalline manufactures products that include rainscreen panels, insulated panels, spandrel panels, floor-to-floor framing systems, beams, copings, fascia panels, soffits, façade cladding, perforated panels, sills and fins.

"With an extremely full order book we made the decision to invest in the rainscreen and re-cladding side of our business," says works manager Stuart Houl. "Although we have a number of press brakes on site that can make our products, we did our research and calculated that investing in a panel bender would replace the work of two or three press brakes. So the idea was to make ourselves leaner, but more productive."

He continues: "We looked at two panel benders, but were drawn to TruBend Center 7030 after speaking with TRUMPF and from watching online videos of the machine in action; not demonstration videos, but actually in use at customer premises."

The fully automated TruBend Center 7030 panel bender arrived in March 2022 and is now busy manufacturing aluminium sheet into rainscreen panels and tray panels. Current batch sizes are around 400-600.

"We keep the machine fully utilised through the day and have the facility to run it 24 hours if needed," says Stuart Houl.

The TRUMPF TruBend Center 7030 features a 2-axis part manipulator that positions the sheet and even enables negative bends. Complementing this is a rotary part manipulator that secures the blank and rotates it to the required position completely independently.

"We really like the offline programming software, which is really quick," says Stuart Houl. "However, we also like the fact that we can program the machine online if needed. As a result, we don't have to wait for a programmer, the operator can get us up and running."

Another impressive feature of the machine is its ACB laser technology, which ensures precise angles for a first part/perfect part approach. According to Stuart Houl, this measuring device has "made a big difference". However, the biggest differentiator between panel bender and press brake technology is surely speed, something that has not gone unnoticed at Metalline.

"The speed of TruBend Center 7030 is unreal in terms of the amount of work it can produce," states Stuart Houl. "As it's three times



quicker than a press brake, we can increase productivity through the shop, which leads to shorter lead times." Within the first few months after installation of the TruBend Centre 7030, we have witnessed an increase in turnover of around 20 percent.

Metalline also has a TruPunch 3000, acquired in 2017, on site. This machine, which Stuart Houl describes as 'bulletproof and 100 percent reliable', feeds work to the new panel bender. In addition, the company has just placed an order for a new TRUMPF TruBend 5170 press brake to complement the TruBend Center 7030.

"Although the TruBend Center 7030 is the best machine in the world as far as we're concerned, we sometimes need to process panels beyond 3 m in length," explains Stuart Houl. "While we already had press brakes from TRUMPF competitors, by ordering the TruBend 5170 it will provide us with software commonality, so we can switch between the two TRUMPF machines without compromising product quality."

Metalline sees quality as the underlying reason for its success, making it a non-negotiable factor when identifying new capital investments.

Stuart Houl concludes: "We know that our customers want high-quality products, so we only invest in machinery that can meet these requirements. "Investing in the latest technology goes with the territory these days."

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The advantages of CNC press brakes

CNC press brakes are powerful and versatile machines that are used to bend and shape metal sheets and plates. They are widely used in a variety of industries, including automotive, aerospace, construction and manufacturing.

One of the main advantages of CNC press brakes is their precision and repeatability. These machines use CNC technology to accurately bend metal to precise angles and dimensions. This makes them ideal for tasks such as creating complex parts and components, as well as for producing large numbers of identical parts.

Another advantage of CNC press brakes is their speed and efficiency. They can bend metal quickly and with minimal waste, which can help to increase productivity and reduce costs.

CNC press brakes are also highly customisable and can be outfitted with a variety of different tools and attachments. This allows them to handle a wide range of materials and thicknesses and to perform a variety of different bending operations, such as air bending, bottoming and coining.

Some of the industries that use CNC press brakes include aerospace, automotive, construction and manufacturing. In aerospace, they're used to bend and shape the metal sheets that make up the airframe of an airplane. In automotive, they're used to create the body panels, frames and other components of cars and trucks. In construction, they're used to fabricate metal parts for buildings and other structures and in manufacturing, they're used to create a wide variety of products, from appliances to medical equipment.



In conclusion, CNC press brakes are powerful and versatile machines that are used in many industries. They provide precision and repeatability, efficiency and speed and can be outfitted with various tools and attachments to handle a wide range of materials and thicknesses.

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ESAB's best optical experience ever

New Sentinel A60 automatic helmet offers larger, clearer, true-colour view while welding

Further advancing its leading Sentinel™ automatic welding helmet technology, ESAB, a leader in fabrication technology, has launched its new Sentinel A60. Compared to the Sentinel A50, the new Sentinel A60 offers a 40 percent larger viewing area that measures 118 x 71 mm and an optical quality rating of 1/1/1/1 for a distortion-free view. It comes with the company's new OpTCS™ broad-spectrum light control technology and True Colour view for a clearer distinction between the arc, the weld puddle and heat-affected zone.

Sentinel A60 also adjusts shade in half-point increments from shade 5 to 13. A total of 18 different shade levels covers every shade needed for welding and cutting, from oxy-fuel and plasma cutting to low-amperage TIG to high-amperage welding with large electrodes. An external Grind Mode button maintains a passive shade of three for fit-up or grinding, eliminating the need to lift the hood or switch it out for a grinding shield. Four arc detection sensors provide a switching time of 0.8 milliseconds, so an operator will never be caught off guard by a co-worker's arc or when welding out-of-position. The new Sentinel A-60 also adds a Shade Lock feature, allowing the ADF to remain in the darkened state while this feature is activated.

"When we launched the Sentinel A50 at FABTECH 2017, its radical design and performance disrupted the PPE market," says Olivier Biebuyck, president of EMEA and global products at ESAB Corporation. "With the Sentinel A60, we continue to prove that ESAB leads the market with automatic helmet technology that helps improve welding results and operator satisfaction, demonstrating our commitment to developing innovation anchored in serving customer needs."

"Sentinel A60 combines a superior optical experience with productivity-enhancing benefits," states Kevin Beckerdite, global product manager for PPE. "The wider view creates more spatial awareness prior to welding. The superior optics help welders keep the weld puddle centered in the joint, keep the electrode on the leading edge of the puddle, position a cutting torch more accurately and do it all while reducing eye fatigue."



Signature design

The Sentinel A60 is designed with ESAB's signature rounded, low profile shell for better clearance in tight areas and more protection from light and sparks. Sentinel A60 improves operator comfort with its five-contact-point Halo™ headgear, which better distributes helmet weight and offers hundreds of thousands of fit adjustments. At 644 g, the Sentinel A60 weighs just 4 g more than the previous model, an impressive engineering feat because the Auto-Darkening Filter (ADF) cartridge is the heaviest item on a helmet.

Now available globally, Sentinel A60 certifications include the following: CE: EN175; EN379; EN166; ANSI: Z87.1; CSA: Z94.3; AS/NZS 1338.1; and ISO 16321. Internal warning lights alert the operator of grind mode, low battery and ADF shade lock. The Sentinel A60 comes with two replaceable CR 2450 lithium batteries with solar backup and a large outer protective lens is available in high contrast clear and amber tints.

ESAB exists to shape the future of welding and cutting. It connects fabricators with the widest range of products under its leading brand portfolio with the latest technologies to solve virtually any industry challenge. The

company backs it up with its knowledge, experience and passion to help customers be more productive than ever before.

The company is a leader in the production of welding and cutting equipment and consumables. Its innovative, world-renowned equipment and solutions are developed with input from customers and built with the expertise and heritage of a manufacturing leader. ESAB offers a world of products and solutions for virtually every welding and cutting process and application.

For more than 100 years, ESAB has transformed industries built by fabricators and provided complete workflow solutions through its diverse portfolio of products from more than 40 of the most trusted brands in welding and cutting in the world. From industrial demands to repair and maintenance, innovators that shape the world rely on ESAB's portfolio. To learn more, visit: <https://esab.com/sparkweek>

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The Fronius logo, consisting of the word "Fronius" in white italicized font inside a red oval.

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Successful use of potential

With double-digit sales growth, 2022 was the best year in the history of Fronius Perfect Welding, despite the extremely challenging conditions. In 2023, Fronius would like to continue growing in the welding technology sector.

In addition to the enormous expansion of manufacturing capacities for welding systems and torches, Fronius' focus for 2023 will be on solutions to alleviate the shortage of skilled workers, as well as on energy and resource-conserving technologies.

WeldCube Navigator

For Fronius Perfect Welding, 2022 was characterised by strong growth and a series of trend-setting innovations. Both of these put the company in a good starting position to face the new year with confidence and trust in its own innovative strength. "In our research and development work, we proactively respond to the constantly changing market requirements. We put ourselves in our customers' shoes and try to offer the best possible solutions for their challenges," explains Harald Scherleitner, global director of sales and marketing, for perfect welding at Fronius International GmbH. "We develop highly user-friendly, top-quality devices that can be used flexibly and expanded as required. The idea of sustainability plays an important role in every step of product development. We pay attention to the longevity, repairability and recyclability of our welding systems."



Technical highlights of 2022

Determined to achieve these objectives, Fronius introduced several pioneering innovations to the market last year. An undisputed industry highlight was the market launch of the new iWave Multiprocess PRO. Whether for TIG, MIG/MAG or manual metal arc welding, this 3-in-1 system saves companies from having to buy several different pieces of equipment, which saves money and natural resources. Regarding the increasing shortage of skilled workers, another world first followed in the form of Fronius' "TIG DynamicWire" welding package and the appropriate cold wire components for the iWave. All of this makes it easy, even for beginners without years of training, to achieve high-quality TIG seams with a wire feeder.

Since 2022, Fronius' aims have been to reduce the workload of skilled workers, to deploy these workers optimally and to protect them. With the Fronius CWC-S Cobot welding cell, the step towards automation proves profitable from batch size 1 and therefore also for small and medium-sized companies. While the CWC-S works around the clock to weld components with consistent quality, welders are able to devote more time to more demanding tasks and are optimally protected by Fronius equipment such as the Fronius Vizor Air/3X respiratory protection system and the Vizor Air/3X Connect fresh air helmet. The brand-new mobile Exento extraction systems and Exento fume extraction welding torch offer excellent protection from welding fumes for welders and everyone working in their vicinity.

Cleanliness is essential when it comes to high welding quality. That is why Fronius has developed environmentally-friendly cleaning processes. The fully automatic Acerios cleaning system sets new standards in the industrial manufacturing process. Based on hot-active plasma technology, it impresses with its low energy consumption and high level of efficiency, and does not contain any environmentally harmful cleaning additives. For the manual cleaning of stainless steel surfaces and TIG weld seams, Fronius has unveiled the latest generation of the MagicCleaner. This advanced series cleans quickly, effectively and in an environmentally-friendly manner.

As a joining technology specialist, Fronius is



passionate about arc-related innovations. That's why customers can look forward to many more innovations in 2023.

Welding trends for 2023

In 2023, hot topics for the welding industry will primarily be the shortage of skilled workers, sustainability and fully exploiting the potential offered by digitalisation and automation.

Fronius has a comprehensive understanding of sustainability and its ecological, social and economic aspects and has established a strategic management system in the field of corporate social responsibility, pursuant to ISO 26000, ONR 192500 certified. The interest shown by customers also reflects how sustainability awareness is on the rise in trade and industry. That is why the company regularly undergoes evidence-based sustainability assessments, which are carried out by objective third parties such as EcoVadis or the NQC Supplier Assurance Platform. In 2022, Fronius was awarded EcoVadis Silver status for the first time, which means that it can now proudly count itself among the top 25 percent in the industry.

Investments and innovations

In 2022, Fronius invested €187 million in the expansion and conversion of manufacturing sites. In 2023, its total investments will increase to more than €233 million. The usable area of its Sattledt site in Austria was expanded from 41,000 m² to 69,000 m² and is already gradually being put into operation. "Among other things, we are creating space for additional workstations and production lines for systems equipment and ensuring a stable manufacturing situation. We are hoping to take on around 1,300 new employees Internationally by the end of 2023. A lot will also happen at the Pettenbach site in 2023. For example, additional

capacities for welding torch manufacturing will be created there,” reports Harald Scherleitner.

The welding portfolio is being expanded to include several technical solutions to help counteract the shortage of skilled workers. Fronius is relying here on the comprehensive digitalisation of all processes and on intuitive, user-friendly systems and applications. These will help employees to get up and running more quickly and to carry out demanding, high-quality welding processes.

Standardised welding processes with the WeldCube Navigator

In 2023, Fronius is set to launch the WeldCube Navigator, a digital tool that will



standardise work instructions in a new way and simplify knowledge transfer. A predefined step-by-step guide on the display will guide welders through their tasks. This will not only improve the welding quality, but the WeldCube Navigator will also make familiarisation and training easier and faster.

Realistic welding training like never before

Fronius' virtual welding training does not use any material, reduces costs and has been successfully used for years. With the new Welducation Simulator, which is set to be launched in the fall, Fronius will take this form of welding training to a new level. Packaged in a standard welding torch housing, with real torches and a realistic representation in Augmented Reality (AR), the Welducation Campus platform that comes with the simulator will offer comprehensive quality welding training with theory, welding tasks and knowledge testing.

New hardware solutions

In addition to digital innovations, Fronius will introduce new hardware solutions in 2023. The Dual Wire Feeder is a double wire feed



for the Fronius TPS/I series. Equipped with two wire rollers and two hose or burner packs, the welder can easily and very quickly switch between two wire thicknesses or materials with the dual wire feeder.

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Extraction welding torch system for automated welding

Up to 95 percent less fumes due to direct extraction

The requirements for occupational health and safety measures and safety technology are also continuously increasing in welding technology. The Technical Regulations for Hazardous Substances (TRGS) require welding fumes and harmful substances to be extracted at the point of origin in order to comply with the workplace limit values (AGW) for hazardous substances. Efficient solutions for welding fume extraction are necessary to protect employees from harmful welding fumes. The extraction welding torch system for automated welding offers a safe and effective extraction of welding fumes directly at the source. Up to 95 percent of the fume is eliminated directly during welding at the point of origin near the arc. The employees benefit from clean air and a better working environment.

Reduced investment volume with low operating costs

The measures required for collecting, extracting and filtering the flue gases in robotic systems are often associated with great effort. Large collection hoods with curtains, complex pipe systems and a large filter unit are necessary to extract and clean the polluted air. When extracting directly at the welding torch, the volume of polluted air is much smaller. By using the extraction welding torch system, users have to invest significantly less in extraction technology, air ducting system and filter device, with the same effect. A flexible hose with a small diameter replaces the complex pipe system for discharging the contaminated air to the filter unit. Due to the smaller volume of contaminated air, a smaller filter unit is necessary. As a result of the optimised energy efficiency as well as the minimised effort for cleaning and replacement of the filter components, the operating costs are considerably reduced.

Easy retrofit

The available geometries of the extraction welding torches correspond to the geometries of the standard welding torches in use. An extensive correction of the robot welding programs is not required. This means that existing robot systems can be retrofitted with the extraction welding torch system without great effort.



CLOOS now also offers an extraction welding torch system for automated welding



The system extracts up to 95 percent of the welding fumes directly at the source

Robot and welding technology from a single source

Since 1919, Carl Cloos Schweisstechnik GmbH has been one of the leading companies in welding technology. More than 900 employees all over the world realise production solutions in welding and robot technology for industries such as construction machinery, railway vehicles, automotive and agricultural industry. The modern CLOOS welding power sources of the QINEO series are available for a multitude of welding processes. With the QIROX robots, positioners and special purpose machines, CLOOS develops and manufactures automated welding systems to meet the specific requirements of the customers. The special strength of the company is in its widely spread competence. From the welding technology, robot mechanics and controller to positioners, software and sensors, CLOOS supplies everything from a single source.

Innovative robotic welding solutions from CLOOS UK

Based in Cannock, Staffordshire, CLOOS UK develops, manufactures and delivers innovative welding processes and solutions that contribute to the long-term success of companies. Its motivation is to help your business compete at the highest level. It offers its customers individual solutions which are optimised and adapted specifically to your product and production requirements.

With its QINEO, the new generation of welding machines for manual and automated applications and QIROX, the system for automated welding and cutting, its product range covers the entire spectrum of arc welding technology. The product portfolio also includes intelligent software, sensor and safety technology solutions; all of which are customised to meet specific needs and requirements.

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