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**Technical Closing Report METAV 2022**

**Düsseldorf, 22 September 2022. –** After four years, METAV - International Exhibition for Metalworking Technologies opened its doors again from 21 to 24 June 2022. More than 180 exhibitors from 16 countries presented their products and solutions. These ranged from metalworking machines and tools to clamping systems, handling and measuring technology, cleaning systems and special software solutions. The topics of energy efficiency and sustainability took center stage on many stands.

**Support before, during and after processing**

ProHandling GmbH from Magdeburg is a specialist distributor of handling systems. At METAV 2022, it presented the ergonomic 3arm handling device, which supports the weight of tools and thus relieves the strain on the person using them. Another handling system designed to support workers is the Mate passive exoskeleton from Comau. It supports movement above a certain angle, and thus facilitates overhead working by reducing strain on the shoulders.

Flaig Magnetsysteme GmbH & Co. KG, Hardt, a specialist solution provider in the fields of magnetic load carrying and electro-permanent lifting magnets, presented its FXE 4000 electro-permanent lifting magnet. It combines the fail-safe advantages of permanent magnets with the user-friendliness of electromagnets. The permanent magnet is electrically activated via the mains, meaning that the state of the magnet remains unchanged in the event of a power failure and any load being lifted at that time continues to be held. The electric control allows the operator to use the device without any physical effort, even in areas that are difficult to access, and lift loads of up to 4,000 kg. The lifting magnet is also highly energy-efficient.

Walter Bautz GmbH, based in Bickenbach, presented customizable clamping devices from the US manufacturer Chick. The easy-to-operate jaw change mechanism allows the modular clamping system to be converted quickly and easily for different applications, taking the strain out of shop-floor working. This saves time and ultimately costs.

The Haubex clamping system from Lang Technik GmbH, Holzmaden, is a flexible and cost-effective automation solution for small batches. It can be integrated in the tool magazine itself, turning it into an automation system. The hood serves as a carrier system for the clamping device and workpiece blank and can be changed directly from the tool magazine. This system eliminates the need for additional peripherals that would otherwise be required to automate processes.

Rego-Fix AG from Tenniken in Switzerland is a manufacturer of high-quality and high-precision tool clamping systems. At METAV 2022, the company presented its reCool clamping system, which enables inexpensive retrofitting of peripheral or internal cooling for static and driven tools. It can be used for both oil and emulsion coolants and builds on existing ER11 to ER40 clamping systems. Its high-pressure hoses allow it to be used at coolant pressures of up to 150 bar. The Torco Block tool assembly system was also presented. Torco Block features an integrated tightening torque indicator which simplifies tool clamping by clamping toolholders to the correct torque regardless of the clamping wrench used. The fact that the correct tightening torque is used ensures accurate tool concentricity and high component quality.

The high-precision JetSleeve 2.0 series shrinkfit chucks from Helmut Diebold GmbH & Co., Jungingen, Germany, can supply cooling lubricant or compressed air through small nozzles at the front end of the tool holder. The resulting Venturi effect keeps the cooling lubricant on the tool, even at higher speeds. This allows the chips to be removed accurately, even in inaccessible cavities. This helps to avoid process interruptions and increase tool life.

**Machine tools – the heart of metalworking**

WSF Werkzeugmaschinen GmbH, Neunburg v. Wald, presented the Mori Seiki licensed Smec SL 2500LM CNC lathe on its stand. Smec (Samsung Machine Tools Engineering Company) has been manufacturing and distributing machine tools, semiconductor equipment and robotic technologies, including this high performance slant bed lathe, for over 25 years. Components up to a diameter of 405 mm and a length of 1004 mm can be machined at a maximum speed of 4,500 rpm and a spindle power of up to 18.5 kW. Users can choose between a Fanuc or Siemens control for machine operation.

Spinner Werkzeugmaschinenfabrik GmbH from Sauerlach exhibited no less than eight machine tools on its stand. These included various machining centers for three to five-axis component machining, universal and precision lathes, and the TTS 65 Duplex high-performance turning center. It has a main spindle, a counter spindle and two parallel processing turrets. It is available with an optional bar feeder, and the cycle time can be reduced, thus optimizing series production.

The Swiss machine manufacturer Fehlmann AG delivers maximum quality, precision and sustainability. The Picomax 56mill milling machine was one of the products on display alongside the Versa 645 linear 5-axis machining center developed for series production and equipped with the Fehlmann Milling Center Manager (MCM). It allows conventional milling, drilling and thread cutting, but can also be operated under CNC control. This makes it particularly suitable for use as a training machine.

At METAV 2022, Düsseldorf-based Sodick Deutschland GmbH presented its VL400Q precision wire EDM with electromagnetic linear drives. The manufacturer guarantees high-precision positioning even after more than ten years. In addition, the machine has automatic wire threading. The wire is cut thermally, thereby preparing the wire end and simplifying the wire threading process. A further feature is the so-called *pop-up function*, which automatically detects the start hole and thus facilitates unattended machining.

Hurco Werkzeugmaschinen GmbH, based in Pliening, Germany, presented the Takumi brand VC1052 3-axis CNC machining center. It is now also available with either Siemens or Heidenhain controls, which the manufacturer hopes will enable it to tap into a larger customer base. As an additional control option, the Hurco 5-axis machining center is equipped with the in-house Hurco Max5 control. This control system has a very simple structure which facilitates the implementation of 3D models, allowing additive manufacturing component geometries to be defined as the initial geometry. This simplifies reworking and increases productivity. A simulation of the process steps visualizes the machining before the process starts in order to avoid possible collisions or undesired travel paths.

Innomax AG, the specialist in waterjet cutting systems and cutting technology based in Mönchengladbach, Germany, exhibited the Omax OptiMAX 60X jet machining center. It has a movable head which allows automatic compensation of the cone created by the water jet, producing high-precision cuts and contours in almost any material. During a live demonstration, visitors could experience for themselves how even processes with waterjet pressures of up to 2000 bar do not necessarily have to generate high noise levels.

Citizen Machinery Europe GmbH, Esslingen, a subsidiary of Citizen Machinery Japan based in Miyota (JP), presented the Miyano BNE-65MYY CNC short turning machine at METAV 2022. Its hand-scraped flat slideways enable the complete high-precision machining of components of up to 65 mm in diameter. The Cincom L32-1M12 sliding head automatic lathe, also on display, offers very high performance and is highly flexible. Its modular design allows it to be retrofitted, turning it from a 5-axis machine into a high-end model with B-axis and Y-axis for backworking, making it ready for possible machining tasks in the future.

The RT 500 CB rotary table grinding machine from grinding machine manufacturer Geibel & Hotz GmbH in Homberg (Ohm) has a CB control system designed for one-off or small batch workshop production. This facilitates easy operation and rapid process changes. In addition, it has an electric handwheel which allows the infeed for adjustment work to be carried out with micrometer-level precision. With a Siemens Sinumerik control system, the FS 840 KT-CNC CNC-controlled surface and profile grinding machine features an extensive cycle package, dialog and contour programming, as well as online help, data checks and numerous auxiliary functions.

At METAV 2022, CMA Maschinen GmbH from Oeding in Westphalia presented a 3RD series CNC drilling center. Its open design allows the next component to be loaded while the first is still being machined. The simply designed in-house control system consists of two parts. In the first part of the Windows-based software, an integrated CAM solution can be used to load the component as a CAD file and to generate the manufacturing program from it. The second part of the software is then the actual machine control; here, CMA places great emphasis on ease of use.

Röders GmbH, Soltau, in conjunction with MHT GmbH, Schramberg, presented its medium distributor. The air-cooling lubrication system facilitates efficient, cost-effective and, above all, sustainable dry machining of almost all materials. An air jacket is created along the cutting edges to the machining point. This reduces the frictional pressure, resulting in lower temperatures and less wear on the tool. If the material requires additional lubrication, a lubricant aerosol can be added via a microspray pump. The system can be configured for external feed for milling applications or for internal feed for drilling.

**News from the Start-up Area**

Blue Effekkt Lubricants GmbH from Neuss presented the water-based cooling lubricant Aquaslide. This is oil and ester free. As a result, no hazardous substance labels are required. The cooling lubricant is itself completely new, but the company also aims to deliver an overall package that revolutionizes and simplifies the handling of cooling lubricants in the metalworking industry. This sets them apart from the lubricants currently in use and, as sustainable alternatives, they make a major contribution to environmental and health protection.

AM Pioneers GmbH from Dornbirn in Austria has set itself the goal of incorporating 3D printing systems permanently into industrial use. The company provides support in the selection and implementation of additive manufacturing systems and provides support to ensure full capacity utilization in the manufacturing process. The range of materials extends from plastics and metals to continuous carbon fibers. To ensure high component quality, software can be used to analyze the geometry of the manufactured component (recorded by means of an optical measuring system). Any deviations are then automatically corrected and the correction data is passed on to the machine for compensation. For the future, AM Pioneers is also keen to make use of sensors during the additive manufacturing process itself.

Spanflug Technologies GmbH, based in Munich, Germany, offers an innovative solution for the flexible procurement of turned and milled parts. Customers can use an online calculator to determine prices for turned and milled parts in a minute or less. All they need do is upload the model of the component, and the platform's innovative algorithm takes care of the rest. It analyzes the component, determines the necessary machining steps and generates an overview of the required work steps and tools as well as a cost estimate. The price and delivery date are then displayed, showing the time at which the customer can order the component and have it produced by one of Spanflug's manufacturing partners.

Berlin-based WeAre GmbH is making a major contribution to climate protection with its software solution. By enabling real-time, non-location-dependent collaboration on machinery, equipment and buildings with their virtual reality (VR) software, workflows can be made more efficient, thereby reducing the need for business trips. Staff use the software to work on an immersive VR model instead of on a monitor-based 3D CAD model. A single component can be presented to customers without the need for a physical prototype in the digital salesroom, or they can be given a tour of an entire machine.

**Precision with every cut**

Sustainability is also a topic of interest to tool manufacturers. The main focus here is on the efficiency of the tools. One way to increase the efficiency of tools with interchangeable active elements is to increase the number of cutting edges per insert. This allows the inserts to be rotated more frequently and used for longer overall. The amount of carbide required is reduced as a result. Jongen Werkzeugtechnik GmbH from Willich is pursuing this goal by offering step milling cutters in which the individual inserts have up to six cutting edges. Face milling tools even have up to eight cutting edges per insert. Depending on the carbide grade and coating, these tools can be used for almost all materials. Jongen takes care of the entire tool manufacturing process chain, including everything from carbide production to delivery to the customer. This allows it to supply special tools at short notice and in high quality to the customers. In its Rapid Line series, Jongen produces special carbide cutters, special carrier tools and special indexable inserts, all of which are designed and manufactured in close consultation with the customer.

Tübingen-based carbide tool manufacturer Paul Horn GmbH gave a live demonstration of its tools in an ABC series index machine on its trade fair stand. The tools presented at the fair included the expanded range of CBN tools, which enable high productivity in the machining of sintered materials, hardened steels and superalloys.

Ernst Graf GmbH, Dietingen-Böhringen, also presented its indexable insert combination tools (developed jointly with Paul Horn) on the Paul Horn GmbH stand. They can be used for creating flat surfaces in the turning process while simultaneously producing a circumferential chamfer. This saves a process step and reduces production times. Also featured in the joint product portfolio are grooving tools with a direct interface for multi-spindle automatic machines. Using these tool holders eliminates the need to procure special adapters and increases the rigidity of the tooling system.

Karl-Heinz Arnold GmbH, Ostfildern, Germany, also presented flange-mounted holders for grooving tools at METAV 2022. These can increase stability during grooving or parting, which can improve process reliability. The tool holders are suitable for a parting range of 20 to 140 mm, can be mounted conventionally and overhead, and are available with either internal or external cooling. Alongside various other tool solutions, Karl-Heinz Arnold GmbH also showed its Arno Store Manager tool management system. The sturdy tool cabinets are available in three versions with individually configurable compartments and can be integrated into any manufacturing environment through interfaces to all common ERP and tool management systems.

Zecha Hartmetall-Werkzeugfabrikation GmbH from Königsbach-Stein specializes in miniature tools which offer maximum precision. Zecha’s standard microtools and special tool solutions are used above all in medical and dental technology, in the watchmaking industry, and in the automotive and tool and die industries. At METAV 2022, Zecha gave a particularly impressive presentation of its micro-milling tools, which can be used to produce mirror-smooth surfaces without further finishing.

**Making recycling more efficient**

Ruf Maschinenbau GmbH & Co. KG from Zaisertshofen specializes in the production of briquetting systems for metal chips and is the world market leader in the field of hydraulic briquetting presses. Briquetting offers multiple advantages. These include a smaller footprint, less burnup when melting briquettes, and a higher melt yield than loose chips. In addition, it allows the cooling lubricant pressed out of the moist chips to be recovered and reused. Possible briquette sizes range from 60x40 mm to 150x120 mm, although the briquette length is variable within set limits. The briquettes can be either round or square in shape. The briquette format is selected depending on the material being briquetted and the required throughput.

Höcker Polytechnik GmbH, Hilter a.T.W., also presented a briquetting press for metal chips at METAV 2022. The BrikStar iSwarf 50 has been developed to compress smaller quantities of metal chips. Thanks to its compact design, it can be used either as a space-saving stand-alone solution or as an integrated press connected to a processing machine for automated operation. It is suitable for briquetting aluminum, steel and gray cast iron, with a maximum briquetting capacity of up to 50 kg/h for aluminum and up to 90 kg/h for steel and gray cast iron.

**Measurement technology in manufacturing**

The product range of Carl Zeiss Industrielle Messtechnik GmbH from Oberkochen includes coordinate measuring machines, optical and multi-sensor systems as well as measurement software for the automotive, aircraft, mechanical engineering, plastics and medical technology industries. Zeiss presented its O-Inspect series, among others, at METAV 2022. The multisensor measuring devices combine tactile measuring methods for fast and precise 3D measurements with optical measurements for sensitive surfaces. This allows measurement tasks to be performed in less time and with greater reliability.

Keyence Deutschland GmbH, Neu-Isenburg, presented a digital measuring projector from its IM series. It is used in quality assurance and enables optical capture of up to 300 measurements in just one scan, thus enabling components to be inspected in just a few seconds. The 3D coordinate measuring system from the XM series of the Japanese manufacturer Keyence enables hand-guided tactile measurement of form and position tolerances during the production process itself. The wireless hand sensor makes the system easy and flexible to operate.

Studenroth Präzisionstechnik GmbH from Schöneck-Kilianstädten is a family-owned company specializing in measuring technology. It offers solutions ranging from hand-held measuring devices to horizontal linear encoders and height measurement devices. At METAV 2022, it presented the Aberlink Extol 370 workshop coordinate measuring machine. The measuring machine is highly robust and is designed for round-the-clock operation. It can be used either next to a machine tool, in a manufacturing cell or in a designated inspection area. It has fully sealed recirculating bearings for dirt immunity. The total of five temperature sensors, which monitor both machine and ambient temperature, ensure that the measuring system achieves a scale resolution of 0.1 μm and a 3D accuracy of (2.6 + 0.4 L / 100) μm even in non-climate-controlled environments. The automatic tool offset correction available with the Aberlink 3D software enables it to be integrated into a fully automated production process.

**Sustainable solutions in air and component cleaning**

Sustainability is also of major importance in the field of air purification. Air-Fresh-Service Industriefilter GmbH from Much is making a major contribution to this. Requiring no disposable filters, its electrostatic precipitator systems are designed to separate oil mist, oil smoke and emulsion mist. The filtration is carried out electrostatically i.e. the solid and/or liquid particles of the polluted air are electrically charged, causing them to collect in the electrostatic field of the collector cell. A downstream post-filter mesh earths the purified air to neutralize any residual charge. This means that the filter operates without any pressure loss, thereby further reducing energy consumption.

The patented L.un.a solvent cleaning system from Cemastir GmbH in Lohne also requires no conventional filter as part of an activated carbon unit, thus eliminating the need for costly and energy-intensive filter cleaning. In addition, the highly efficient condenser system allows up to 30 percent of the required energy to be saved during operation. As cleaning media, users can choose between perchloroethylene or class AIII modified alcohols in one and the same machine.

**Customized software solutions**

The Bocholt-based software company Beosys GmbH presented its Enterprise Resource Planning (ERP) software Beosys for machine and plant engineering at METAV 2022. Based on a Microsoft SQL database, the software runs on the Windows operating system, but can also be accessed in a browser on portable or desktop computers, tablets or smartphones if required. The software supports users in all processes during the project cycle, from costing, quotation preparation and delivery date determination to order processing and final costing. The costs are recorded throughout the project as they accrue by a parallel costing system. This allows cost-reducing measures to be taken during the ongoing project if there is a threat of budget overruns.

Hexagon AB, headquartered in Stockholm, Sweden, was represented twice at METAV 2022 in the form of its subsidiaries Hexagon Metrology GmbH, Wetzlar, and Vero Software GmbH, Neu-Isenburg, from the company’s Hexagon Manufacturing Intelligence (MI) business area. While Hexagon MI was giving a live demonstration of its measuring and scanning technology on the first stand, software and data processing were being showcased on the second. The data generated on one stand by the Tigo SF 3D coordinate measuring machine was transmitted wirelessly to the second stand for processing. Hexagon thus demonstrated how an entire process chain can be supported in a way which allows autonomous manufacturing from a single source.

**Conclusion**

Visitors from the region and international guests were treated to the full spectrum of manufacturing process technology. Machine tools and tools are at the heart of production technology. However, visitors were also able to find out about innovations in such areas as handling and automation technology, cleaning and recycling systems, measuring and analysis technology, additive manufacturing and software solutions. The main focus was not only on increasing efficiency and productivity, but also on enhancing sustainability through environmental and health protection.

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*Length: 22,383 characters including spaces*

**For your calendar: The next METAV will be held from 20 to 23 February 2024 in Düsseldorf.**

**Images:**

Wasserstrahlschneiden.jpg

The moving head of the Omax OptiMAX 60X automatically compensates for the cone created by the waterjet, enabling high-precision waterjet cutting and the production of precise small angles in contours.

Qualitätssicherung.jpg

The Japanese company Keyence introduced its IM series digital measurement projector. It is used in quality assurance and can capture up to 300 measurements in just one scan, thus enabling components to be inspected in just a few seconds.

CNC Kurzdrehen.jpg

The hand-scraped flat slideways of the Miyano BNE-65MYY CNC short turning machine from the Japanese manufacturer Citizen allow high-precision machining of components with a diameter of up to 65 mm.

Drahterodieren.jpg

The Japanese company Sodick presents the VL400Q wire EDM machine with electromagnetic linear drives, which position the total of eight axes with great precision even after many years.

**Image source:** Constanze Tillmann, Messe Düsseldorf

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