

**PRESS RELEASE**

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## **Industry 4.0 components changing machine tools and their environment**

**Innovation Forum Düsseldorf exploring theoretical and practical aspects of modern metalworking at METAV 2020**

*Frankfurt am Main, 16 January 2020. Supported by the VDW (German Machine Tool Builders' Association), the first "mav Innovation Forum Düsseldorf" will take place on 12 March 2020 as part of METAV 2020. The Forum, to be held in the Düsseldorf Congress Center, is based on the Böblingen event, which has enjoyed great success over many years. It is aimed not only at machine manufacturers and tool specialists but also at automation experts and users in the field of additive manufacturing.*

The Forum makes use of synergies and offers a dedicated discussion platform. Its aims are to build a bridge between the theoretical (forum) and the practical (trade fair) aspects and to optimise the broad-broad market success of innovations. Participants are already offering initial insights here.

### **Internet of Things boosting innovation**

"Manufacturing Execution Systems have many problems to contend with. In the age of Industry 4.0, they must now evolve into Manufacturing Operations Management solutions – each MES must be extended to make it Internet of Things-compatible," says Johann Hofmann of Maschinenfabrik Reinhausen, based in Regensburg, Germany. This also involves moving from "execution" to "production optimisation through regulation". Manufacturing Operations Management (MOM) focuses on the digitalisation of processes and information to increase both efficiency and transparency.

The following findings from MES/MOM working groups will be presented at METAV 2020. All manufacturers of networkable products (assets) agree on

- a single standardised management shell for each asset, which is delivered along with the asset
- a uniform language such as OPC UA (Open Platform Communications Unified Architecture) or umati.

This is the basis on which uniform OPC UA parameter sets can be created that meet specific requirements. The result is Industry 4.0 components (assets + management shell) which MOM companies can use to establish "Plug and Produce" systems. A simple example is the "plug and play" (now independent) printer installation which is now widespread in the consumer sector. "I expect to see the same thing in machine tools in the medium term," says Industry 4.0 expert Hofmann. "And hopefully the METAV 2020 will provide a first glimpse of these. If all manufacturers of assets, especially machine tool suppliers, succeed in adopting this, we can expect to see a surge of innovation in the software industry. Just as in our own sector." He will be presenting his MOM system for digital high-performance production, which has already integrated the first management shells.

**Supporting customers with complete new solutions**

Consumer electronics are becoming ever smaller and more powerful. This is giving rise to constantly increasing demands on the mechatronic systems in the production machines. The aim here is to improve the level of precision and the dynamics. At the same time, there is growing price pressure from the international competition. "In response we are offering our customers a range of new solutions," says Manfred Winter of JAT - Jenaer Antriebstechnik GmbH. A comprehensive consultation is first given to the systems house customers in order to define a complete solution that fits their precise needs – from mechatronics to servo amplifiers. "A new series of rotary tables, which we will also be presenting at the Innovation Forum Düsseldorf during METAV 2020, is aimed precisely at this," continues Winter. The innovative construction is based on a flat structure which is capable of delivering a high level of torque. The small installation space necessitates considerably simplified integration of the rotary tables into the application, while the dynamic range is also increased. At the same time, new measuring systems offer high resolutions of up to more than 500,000 increments per revolution to enable high-precision positioning at all times. JAT itself also supplies the servo amplifiers – as well as the software which ensures faster setup and error prevention during operation. Digital transparency is provided by another software module called "Transparent machine". Load, stress and energy balance data can be collected at the amplifier level without the need for external sensors. This gives the machine owner a simple tool for retrieving machine data via the fieldbus without the need for additional programming, and for accurately assessing the condition of his plant. This helps ensure long-term superior performance of the machine.

### **Linking machines with mobile robot system**

"We have consistently expanded our series of robots for machine loading," reports Peter Pühringer, Division Manager at Stäubli Robotics Bayreuth. "The unique design of our six-axis robots means that they are ideally suited to meeting the challenges of metalworking. Their advantages, including their enclosed construction, internal cabling, connections beneath the robot foot, high protection class etc., now also apply to our new four-axis robot series. These are our first horizontal jointed-arm "Scara"

robots which are designed to take care of even the most demanding machine automation tasks." The latest Scaras are also available in a splash-proof Humid Environment (HE) version – an advantage if the robots come into contact with cooling lubricants, for example.

Stäubli's mobile robot system is now ready for series production – proving that the future of machine automation is now already reality. It can drive and navigate autonomously, and is fitted with three integrated laser scanners which provide constant monitoring of its surroundings. Equipped with a six-axis robot, this innovation represents a potentially revolutionary solution for machine loading and linking. The mobile robot is able to pick up tools from the magazine, carry them to the machine, and manage the loading and unloading of machine tools – which it can also link together if required. The entire production process can be networked using multiple mobile robots. Stäubli Robotics will be on hand at the Düsseldorf 2020 Innovation Forum to provide further information on this topic.

### **Three questions for scientists**

Parallel talk sessions will be held on various topics at the Innovation Forum. These will cover everything from tools, machine tools, robotics, automation and software through to machine elements and additive manufacturing. Keynote speaker Prof. Dirk Biermann, Head of the Institute of Machining Technology (ISF) at the TU Dortmund University and member of the WGP (German Academic Association for Production Technology), will open the event.

### **Professor Biermann, what do you expect the highlights to be at METAV 2020?**

Visitors to the metalworking trade fair in Düsseldorf will be treated not only to the latest innovations in machine tools, but also increasing numbers of new developments for

the entire process chain and for production organisation, as well as new digitalisation solutions. The networking of people, machines and companies is essential if we are to achieve overall increases in productivity and sustainability. METAV 2020 will showcase the latest solutions to the specific challenges of efficient connectivity and data security.

### **What innovations is TU Dortmund University currently working on?**

The sharp rise in the dynamics and intensity of environment changes is increasingly forcing companies to make rapid and efficient adaptations to their production and factory systems. Decisive competitive factors here include the reaction time and the efficiency of the adaptation measures. Which is why we at TU Dortmund University are offering postgraduate seminar 2193: *Adaptation intelligence of factories in dynamic and complex environments*. Funded by the German Research Foundation, this is a coordinated doctoral programme aimed supporting young scientists in the field of interdisciplinary factory adaptation planning.

### **How do you rate future developments?**

It's very difficult to predict the future right now, as key sectors such as the automotive industry are undergoing unprecedented change and the global political situation is also hard to assess. I very much hope that we will be able to continue to carry out technology-independent research and development in the future, especially for the important mobility sector. In addition, increasing digitalisation and the judicious use of artificial intelligence methods hold great potential for future-oriented innovations across different industries.

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INFO BOX

**Innovation Forum Düsseldorf 2020**

The Forum combines the advantages of a trade fair with those of a congress: it blends a comprehensive conference programme with an exciting exhibition. There will be sessions on various topics, and the whole event will be opened by a thought-provoking scientific keynote. Visitors can move freely between the lecture halls or visit the partners' stands in the accompanying exhibition. There will be generous breaks for networking – and for visiting the practically-oriented exhibition. The programme will be published on 20 January 2020 at [https://mav.industrie.de/innovationsforum\\_ddf/](https://mav.industrie.de/innovationsforum_ddf/)

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### **Background – METAV 2020 in Düsseldorf**

METAV 2020 - 21st International Trade Fair for Metalworking Technologies displays the full spectrum of manufacturing technology. The focus is on machine tools, manufacturing systems, precision tools, automated material flows, computer technology, industrial electronics and accessories. Added to this are new topics such as Moulding, Medical, Additive Manufacturing and Quality. They are firmly established in so-called Areas in the METAV exhibition programme, each with its own nomenclature. The target group of METAV visitors includes all branches of industry that process metals, in particular mechanical and plant engineering, the automotive and supply industry, the aerospace sector, the electrical industry, energy and medical technology, tool and mould making as well as metalworking and trades.

Articles and pictures relating to METAV can be found in the Press section at [www.metav.de](http://www.metav.de).

[https://www.metav.com/METAV2020\\_Innovation\\_Forum\\_EN](https://www.metav.com/METAV2020_Innovation_Forum_EN)

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