

Die Welt der Metallbearbeitung
The world of metalworking



PRESS RELEASE

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“Everything can be measured” – EMO Hannover 2013 will be showcasing state-of-the-art image processing systems in a web-based production environment

Frankfurt am Main, 17 December 2012. – *Faster, more reliable, more accurate, more flexible – the requirements for the production metrology of the future sound well-nigh Olympian in their stringency. The EMO Hannover 2013 will be addressing all the trends of relevance for production operations, responsibly showcased for the target groups involved under the motto of “Intelligence in Production”. One of the major focuses here will be how to handle information from measuring instruments in the web-based environment of Industry 4.0.*

The net sees everything, knows everything and forgets nothing: via web-based customer portals, users can already obtain a complete picture of all the data from the measuring instruments and systems being deployed. Most of these portals are based on a service-oriented architecture, thus optimising operational behaviours and significantly shortening repair and maintenance time. Web-based information platforms enable present-day users to work faster and more cost-efficiently, benefiting from simplified access to all instrument information. Thus design engineers, R&D staff or purchasers can get all

the data they need on their screens by barcode-scanning of the instruments involved.

With measured tread into the future

The EMO Hannover 2013 will show the direction in which production metrology is moving for the future, more or less with a “measured tread”.

A working group of the VDI/VDE Association for Electrical, Electronic & Information Technologies (GMA) has already ventured a look into the future with its “Roadmap 2020 for Production Metrology”. It identifies four major focuses for future production operations. Besides resource-efficient and transparent production processes, these are quality and productivity, and flexible production (this includes workpiece detection, intelligent robot, gripper and safety engineering with image processing and image-based control).

The importance of metrology for obtaining information was formulated back in the 19th century by the English physicist Lord Kelvin, who gave his name to the SI unit for temperature. Information is a crucial factor for a company’s success in regard to resource utilisation. Today, rapid technical advances in industrial production technology provide, with every new surge of development, more information on products and manufacturing processes becomes available. Production metrology supplies information on the features of processes and products.

Indisputably, production metrology is a key technology for quality assurance of products and processes. It helps to secure the leading global status of German technologies. Its perceived importance and development status are outlined by Dr.-Ing. Dietrich Imkamp, who chairs the VDI/VDE’s Roadmap Working Group and in his day job is Head of Visual Systems & Partner at Carl Zeiss Industrielle Messtechnik GmbH, Oberkochen, Germany, in these words: “The metrological acquisition of quality features in industrially manufactured products has been largely solved. Fundamentally, everything can be measured. The challenge for production metrology nowadays is to implement the technology concerned in industrial manufacturing operations, so that acquisition of product quality data can be cost-efficiently achieved.”

The higher information density provided by metrological instruments enables imminent losses due to defective products to be detected at an early stage, he adds. It thus makes a vital contribution towards resource-economical design

and to the transparency and cost-efficiency of production operations. Besides the development of innovative production lines and automated assembly systems, high-precision metrological technology, and in particular the use of image-controlled robots, are prerequisites for the production operations of tomorrow.

Image processing systems, as pulse encoders or “artificial eyes”, have meanwhile become indispensable for production operations. They help machines, lines and robots to make their own decisions. Workpieces fitted with sensors will in future decide autonomously how they want to be machined - they will monitor and control their own production process.

Globally interlinked process chains

The influence exerted by the “internet of things and services” (Industry 4.0) on the development of metrological equipment in industrial production operations is explained by Zeiss’ metrology expert Imkamp: “Globally interlinked process chains are shaping the nature of industrial production operations worldwide. The trend towards higher product quality continues unbroken. In this environment, the exchange of information to assure the requisite quality becomes progressively more important. Many of these data, particularly on the status of the products and production processes involved, are acquired with the aid of measuring instruments.”

Performatively enhanced metrological systems have in recent years led to a substantial increase in the quantity of information available. This necessitates new methods for utilising this information. “Methods for interlinking metrological information with the product, as are being developed in the context of Industry 4.0, can here contribute towards improving data utilisation”, says Imkamp. For example, not only can the test results be added to the product, as is often practised nowadays with a metrological report printout, but also computer-aided information on the measuring procedure and the systems used. This enables the results to be more easily reconstructed, and even reproduced if necessary. Thanks to direct linkage with an individual product, time-consuming assignment procedures between the results and the products concerned are no longer required. To quote Dietrich Imkamp: “The prerequisite for comprehensive computer-aided utilisation of metrological information is open software systems that via suitable standardised interfaces can access all the necessary data.”

Dietrich Imkamp is cautiously optimistic in assessing the feasibility and process-dependability of close-to-production quality assurance in a web-based manufacturing environment – using smartphone apps, for example: “Technologies that we’re more familiar with today from the consumer environment will indubitably come to be used for quality assurance in a manufacturing environment as well. But specialised requirements are going to have to be factored in here, for the reliability and security of data transmission, for instance.”

Particularly stringent requirements will apply here for process-integrated work-piece and tool measurements. The incorporation of metrological technology into the process ranges “from sensors that are utilised directly by the machine concerned to autonomous metrological systems that are integrated via interfaces in the material and information flows of the industrial production processes involved”. Depending on the type of integration involved, disparate requirements will emerge. For all integrated metrological systems, however, it holds true that they are an indispensable constituent of the production process, required to meet the same stipulations in regard to failsafe performance and resistance to environmental factors as must production systems. To quote Imkamp: “Some laboratory systems have problems coping with this. However, purposeful design enhancement in the field of coordinate metrology, for example, or computer tomography, nowadays enables this metrological equipment, previously reserved for the laboratory environment, to be integrated into actual production processes.”

EMO Hannover 2013 – a trade fair as a trend-setter for metrological excellence

The importance of EMO Hannover 2013 as a shop window for production metrology in a web-based manufacturing environment is described by Zeiss’ expert Dietrich Imkamp as follows: “The trends in production engineering currently being discussed are responsively addressed here. Metrology as a service provider for production facilities is crucially influenced by these trends. This also includes handling information from measuring instruments in the context of Industry 4.0.”

Author: Walter Frick, specialist journalist from Weikersheim

EMO Hannover 2013 – the world’s premier trade fair for the metalworking sector

From 16 to 21 September 2013, international manufacturers of production technology will be spotlighting “Intelligence in Production” at the EMO Hannover 2013. The world’s premier trade fair for the metalworking industry will be showcasing the entire bandwidth of today’s most sophisticated metalworking technology, which is the heart of every industrial production process. The fair will be presenting the latest machines, plus efficient technical solutions, product-supportive services, sustainability in the production process, and much, much more. The principal focus of the EMO Hannover is on metal-cutting and forming machine tools, production systems, high-precision tools, automated material flows, computer technology, industrial electronics and accessories. The trade visitors to the EMO come from all major sectors of industry, such as machinery and plant manufacturers, the automotive industry and its component suppliers, the aerospace sector, precision mechanics and optics, shipbuilding, medical technology, tool and die manufacture, steel and lightweight construction. The EMO Hannover is the world’s most important international meeting point for production technology specialists from all over the planet. In 2011, the fair attracted more than 2,000 exhibitors, and around 140,000 trade visitors from more than 100 different countries. EMO is a registered trademark of the European Committee for Cooperation of the Machine Tool Industry CECIMO.

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