

Boehlerit GmbH & Co.KG

Werk VI-Straße 100
8605 Kapfenberg
Austria
Phone +43 3862 300-0
Fax +43 3862 300-796
info@boehlerit.com

Cutting edge from the start

Kapfenberg / Styria, 02/02/2016

Industry 4.0, also referred to the “fourth industrial revolution”, is a term that is mostly used in German-speaking countries. In other places, people are talking about “Cyber Physical Systems”. This refers to the same thing, however, which is to say highly networked, extremely flexible and customisable forms of production. But what does the hot topic Industry 4.0 mean for cutting technology and what answers does Boehlerit supply as a tool manufacturer?

The first industrial revolution was so-called mechanisation in the 18th century. In this period, the loom represented the first step into machine-based production. The second industrial revolution brought Henry Ford’s production line. Electrical automation, and with it the third industrial revolution, first really gained momentum with the first “programmable logic controller (PLC)”. Now we are at the start of the fourth industrial revolution, with the connection of machines and systems for automatic data exchange, both within and outside a business. Private data networks, but also the internet with its limitless possibilities for information exchange are used and incorporated into automation. Industry 4.0 thus interconnects production with the latest information and communication technology, which makes possible largely self-organising production processes. In Industry 4.0, people, machines, plants, logistics and products communicate and cooperate directly with each other. Production and logistic processes between companies in the same production process are intelligently interleaved with each other to make production even more efficient and flexible. The aim is to re-balance out mass and cost-optimised automation against the greatest possible flexibility up to batch size 1 and to combine the two. To put it plainly, this is a matter of taking into account the ever shorter product life-cycles and increasing customer-individuality and to manufacture highly individual products efficiently and in the shortest time.

One field in which this trend is particularly pronounced is cutting technology. Here, highly versatile machining centres are increasingly used, often interlinked to form multi-machine systems, so-called flexible production systems. There are already manufacturing plants with an impressively high degree of automation, in which even the tool change is fully automated, using shuttle systems and robots. However, this requires, among other things, tool management with identification of the tools. The state of the art is that RFID data carriers are used for this. RFID stands for Radio Frequency Identification and functions without contact. The data carriers are transponders and the data saved on it are recognised, read, and/or written via read/write devices. RFID technology became most familiar through its use in product assurance in retail stores.

In order to further improve the use of this RFID technology in the field of cutting tools, Boehlerit is cooperating with the affiliated company Bilz. There, low-cost UHF variants of such RFID chips, so-called smart chips, are

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already used in Thermo Grip® shrink fit chucks. The decisive advantage of these smart chips is that they are pressed in so that they are form-fit and/or friction-locked, using a housing system. This saves the time-consuming gluing-in of the chips, so that the tools are ready to use significantly sooner. In addition, these chips are substantially smaller and can thus also be directly inserted into thin-walled tools. In future, Boehlerit will make use of these advantages and offer the smart chips as basic components for tool identification solutions in line with Industry 4.0.

“We are already using these smart chips in-house,” adds Dr. Ronald Weißenbacher, Director of Research and Development at Boehlerit: “These chips, inserted without adhesive, are ideal for identifying a wide variety of tools. This way, they make it possible for us to implement Industry 4.0 projects in our own production.”

Press release

The company

Boehlerit, headquartered in the Austrian town of Kapfenberg, sets global standards with carbides and tools for the processing of metal, wood, plastics and composites. With cutting materials, semi-finished products, precision tools and tool systems for milling, turning, drilling and forming, Boehlerit ensures process safety and efficiency on a global scale. The company's extensive product portfolio includes highly specialised tools for the machining of crankshafts as well as for the mining industry, for bar peeling, tube and sheet metal processing and heavy-duty machining. The Boehlerit product range also features carbides for construction components and wear protection. When it comes to coating technology, Boehlerit holds a global monopoly, ranging from the first-ever nano-CVD bonding layer to the hardest diamond layer worldwide. With its many years' experience in metallurgy, coating technology and state-of-the-art press technology, Boehlerit is a highly competent development partner for toolmakers.

Press/media contact

Manuel Hofstadler

Mag.

Head of advertisement

Phone: +43 3862 300-586

Fax: +43 3862 300-793

E-Mail: manuel.hofstadler@boehlerit.com

Pictures

Abb. 1: A makeover for Boehlerit

