

GREATER TRANSPARENCY ON ONE PLATFORM

New generation of die casting machines with integrated safety controller

The cold chamber die casting machines of the German company Oskar Frech GmbH + Co. KG have locking forces between 2.750 kN and 52.000 kN. The latest machine generation included improved service and diagnostics features. The integrated safety solution from Bachmann also enabled the safety controller to be moved to the common platform of the M1 automation system.

Oskar Frech GmbH + Co. KG is one of the world's leading suppliers of die casting technology. For over 60 years, the Swabian company, headquartered in Schorndorf, Germany, has based its products on international market standards. It is regarded as a technology leader and stands out on account of the high quality and perfection of its hot and cold chamber die casting machines, as well as die casting tools.

Increasing availability

"We see ourselves as trailblazers with one of the most modern cold chamber die casting machine portfolios worldwide," states Heinrich Kleuren, design and development manager at Frech. "We therefore work hard to meet ahead of time the demanding requirements of our customers in terms of die casting technology and productivity."

Probably the most important indicator for the productivity of foundries is the overall plant efficiency of the die casting cell. This is essentially calculated from the availability of the plant, the cycle times, as well as the quality achieved of the cast parts. Reducing the downtimes of the machine as much as possible, whether for retrofitting or maintenance is therefore very important: "Increasing the availability of the machine by a few percent can mean a significant increase in profit for the foundry," Heinrich Kleuren explains. For this reason also, Frech's latest cold chamber die casting machines also focused on the further optimization of service capability. "One of our declared goals here was to improve diagnostics capability and simplify remote access," Peter Maurer, head of open and closed loop control technology development at Frech, reads from the specifications. ►►

FRECH[®]

Oskar Frech GmbH + Co. KG is headquartered in Schorndorf, Germany, and is one of the leading suppliers in hot and cold chamber die casting technology. The company has around 700 employees and is represented worldwide with 17 subsidiaries.

► www.frech.com

►► **Seamless diagnostics**

"Foundries want to take over the first level support of their machines themselves in order to save both time and costs. We provide them with the necessary tools, such as comprehensive service and diagnostics applications as part of our plant visualization or also remote service solutions, as well as telephone support," says Peter Maurer. Another important step was also the integration of the safety functions on the same platform as the machine controls: "We decided to replace the previous stand-alone safety controller, which did not allow access to its data via the machine controller. The integration of the Bachmann safety solution now enables diagnostics to be carried out on the machine with comprehensive tools, also for servicing," Peter Maurer describes an important benefit of this solution. The configuration and programming of the safety functions are integrated in the SolutionCenter all-in-one engineering

tool, thus enabling standard PLC tasks to be linked seamlessly with the requirements of functional safety.

Integrated safety solution has many benefits

With the large machines Frech primarily relies on a distributed automation. This enables plant sections to be pre-assembled independently of each other, and simplifies cabling. Also here,

» **For over fifteen years Bachmann has stood by us as reliable partner for automation solutions.** «

*Peter Maurer,
Head of open and closed loop control technology*

Heinrich Kleuren recognizes the clear benefits of the integrated safety solution: "Through the possibility of mixing safety and non-safety channels and the

availability of all I/O channels in the software, the wiring effort is reduced so that manufacturing and product quality can be increased." Time is also saved in development, as Peter Maurer comments: "We already know the modules and the development tool very well, since the safety modules are fully integrated in the M1 system and thus also in the SolutionCenter all-in-one development environment."

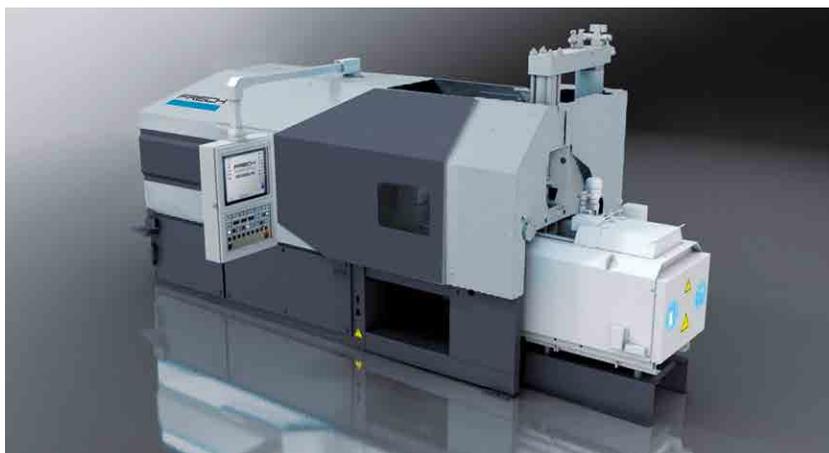
Further penetration with bus systems

The specialists are considering a further penetration of the machine with fieldbuses for the future. Heinrich Kleuren and Peter Maurer are convinced that this is also a logical step resulting from the considerations with regard to Industry 4.0: The networking of machines and plant sections as well as the associated data exchange are gaining increasing importance. This needs a transparency up to the last level, which requires all components within a machine, right down to the smallest valve, to be digitized. "One important feature that we already require the controller system to provide is the ability for different bus systems to run in parallel. We also appreciate this feature on Bachmann's MC205-CPU, which we use and which comes with two Ethernet ports," Heinrich Kleuren adds. One port is used conventionally with the TCP/IP protocol in order to integrate the machines in the network for visualization and remote access. The frequency inverters as well as two sensors are connected to the second port via Profinet.

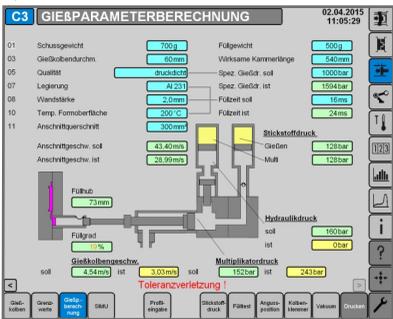
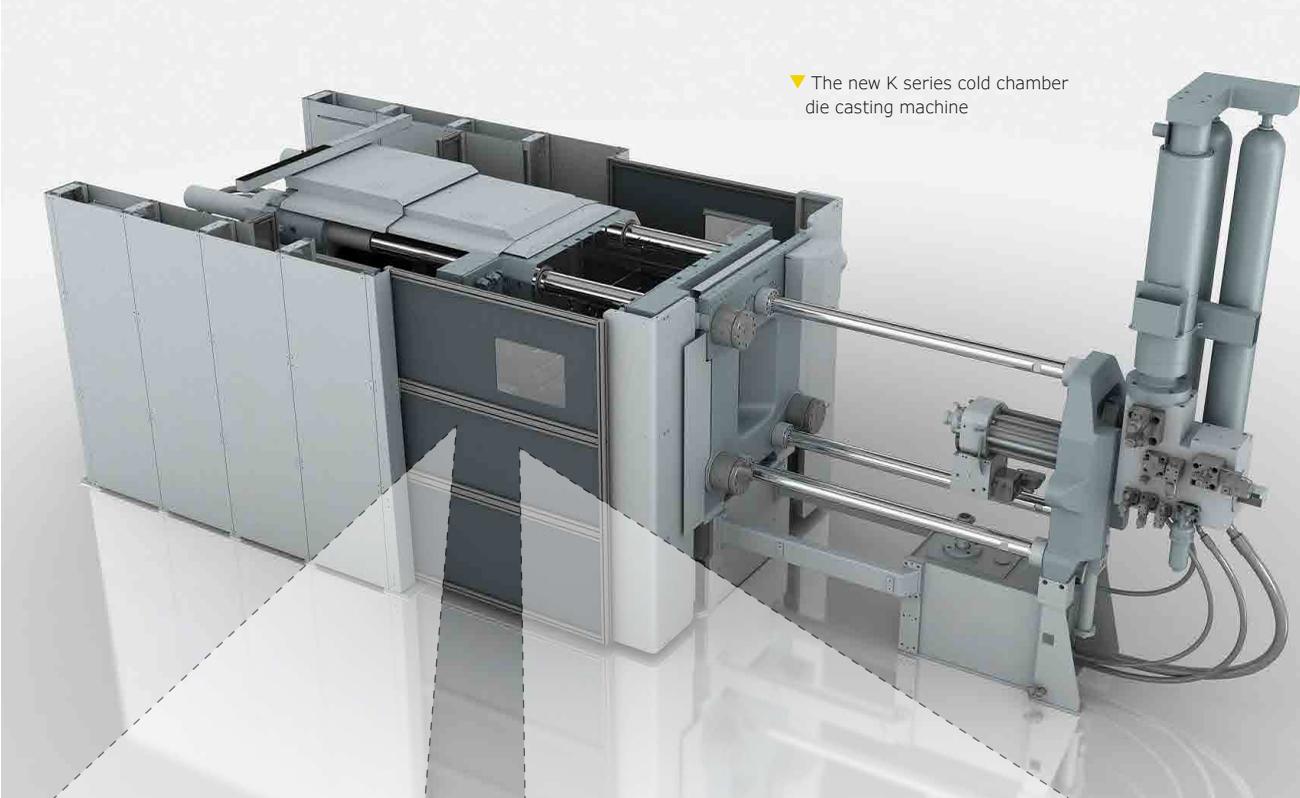
The data for every shot

Manufacturers are increasingly committing their supplier foundries to ensuring

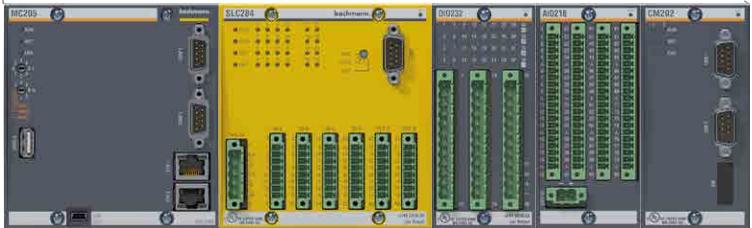
▼ Hydraulic hot chamber machine



▼ The new K series cold chamber die casting machine



▲ Intuitive and clearly designed: Visualization of Frech die casting machines.



▲ Robustness required: Installation of the Bachmann M1 controller including safety controller in the switching cabinet of the new K series cold chamber die casting machine.

the complete traceability of the casting process, right down to the individual component, i.e. for each individual shot: Time stamp, cast pressure, mold, cooling time and many more variables must be logged. "One thing is clear. The volume of data that a die casting machine must provide will increase," Peter Maurer sums up. Even if most of the data is not yet being evaluated by customers today, Frech is ready: The Bachmann OPC server provides you with a PC-compatible software interface in accordance with the OPC standard. This provides the connection to process data and thus the real-time recording of value changes with an exact time

stamp. "The required process values can thus be made available to an external client at any time," Peter Maurer confirms.

Ready for the future

Although the actual casting process and thus the required hardware are not subject to short innovation cycles: "Our plants have a useful lifetime of at least 15 years and many plants have been in operation for up to 30 years," Heinrich Kleuren describes the market environment. Permanent further developments are nevertheless required for the operation of the plants, for HMI operations, visualization and the networking of the

machine: "It is therefore all the more important for our suppliers to abstract hardware and software from each other until short cycles can be implemented without any problem," Peter Maurer adds. "The M1 automation system provides us with a very good basis for this and Bachmann has been at our side a reliable partner for over 15 years."