MAGMA GmbH Press Release

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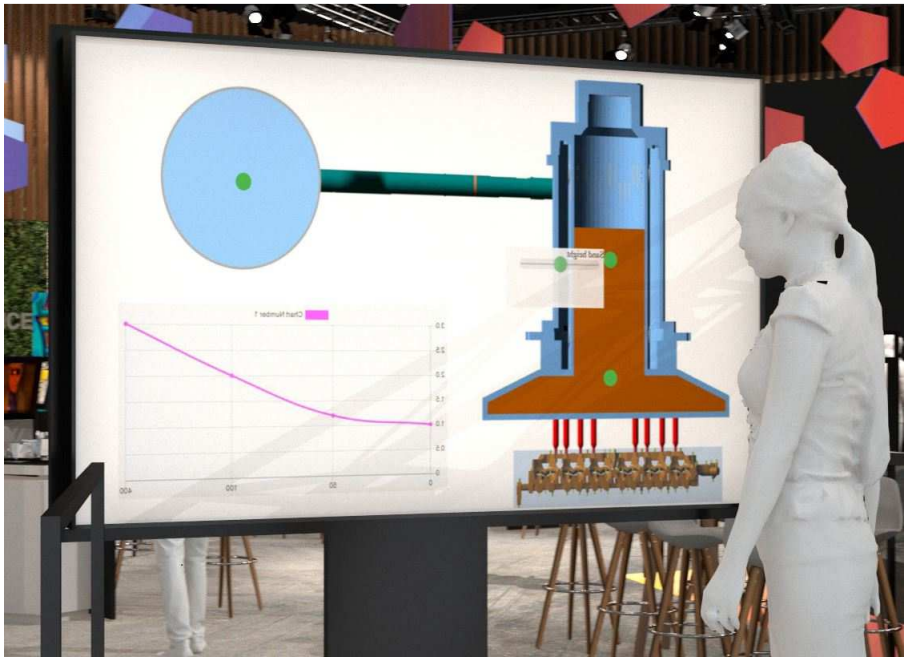
United on the way to digital core production

Three leading technology providers in their fields, MAGMA GmbH, which specializes in the virtual optimisation of foundry processes, Hüttenes-Albertus (HA), a leading supplier of foundry chemicals, and Laempe Mössner Sinto GmbH, the core shooting machine manufacturer, have joined forces to establish a long-term partnership. Together, they want to implement their vision of digital core production and thus deliver on the potentials of Foundry 4.0. At GIFA 2019, visitors will be able to find out precisely what this means at the three partners' respective stands.

In the production of modern, complex castings, it is important to achieve consistent quality in core production, which involves the interplay of several influencing factors and process variables. But it is only at the end of the production process – when you have a finished casting – which you can determine whether the process is able to deliver 100% of the required quality. Foundries would certainly benefit if they could detect possible deviations in advance as this would give them the opportunity to intervene in the process at a very early stage.
And this is precisely what simulation-based visualisations of core production achieve. They make process flow transparent and predictable and take as many process parameters as possible into account. In alliance, this is the vision that drives the new HA, MAGMA and Laempe partnership.

At GIFA, the three partners will be unveiling their revolutionary concept in public for the very first time. The concept is built around a “virtual core shooter”, which will be showcased at the three companies’ stands to give visitors a vivid experience of the partnership’s achievements to date.
On an interactive screen, visitors can adjust various parameters for the core shooting process and assess the results of the simulated core production in real time. As a result, they can see what impact their adjustments have on the shooting process and, consequently, on core quality, answering questions such as: How does the sand height affect the shooting head? What is the impact of vent clogging or tooling cleanliness? At what pressure is the moulding mixture actually shot into the tooling cavity? Which machine settings need to be adjusted to change the tooling design from a single to a split cavity box? Thanks to the software developed by MAGMA, the virtual core shooter is able to simulate the entire shooting process in milliseconds, including material flow and pressure conditions.
“With this patented new tool, we have been able to combine process simulation and real core production. The coupling of the moulding mixture properties with the core shooter and the current tooling allows us to holistically simulate the entire process. This means we can now guarantee reliable core quality”, emphasises Dr.-Ing. Jörg C. Sturm, Managing Director of MAGMA GmbH. “Due to the short computing times, it is even possible to integrate the simulation into a real-time operation of the machine”.
And the next step has also already been taken: In future, parameters relating to the sand-binder mixture will also flow into the virtual model to make core quality forecasts even more accurate. “We will identify core defects that are not visible to the naked eye but nevertheless cause problems further along the process chain”, explains Amine Serghini, member of the HA management team. “Deformations during core storage, core breakage during casting and casting defects are often caused not by the binder itself but by parameters such as the storage time of the sand-binder mixture. A fresh sand mixture flows better, has better compactability and ensures less tooling deterioration

and vent clogging”. The virtual core shooter is used to forecast whether a sand mixture can still be used without leading to core quality issues.
The empirical data behind the direct simulations were gathered during tests at the HA Center of Competence in Baddeckenstedt, Germany, on a state-of-the-art core shooter from Laempe used in this Center. These data allow important influencing parameters and their impact on the casting process in machine and tooling to be modelled accurately. The HA Center of Competence is equipped with a wide range of technical possibilities and provides a valuable platform for partners from different disciplines to systematically advance innovations in joint development projects.
The technical implementation of a real-time, data-based system to control core production has become a reality thanks to the partnership between Magma, HA and Laempe and represents a revolutionary step towards Foundry 4.0. The promising approach opens up a world of new potentials for all three partners as they strive to provide their customers with intelligent solutions for optimized and robust core production at all times.



The “Virtual Core Shooter” - a real Industry 4.0 application

MAGMA at GIFA and METEC

Hall 12 A19/20 and Hall 4 E29

About MAGMA

MAGMA is a worldwide leader in developing and providing software for casting process simulation and virtual optimization. MAGMA stands for robust, innovative cast solutions and for reliable partnerships with the metal casting industry, including casting designers and buyers. MAGMA's products unite the complexity of the casting process with user-friendliness to create economical solutions for its customers. MAGMA partners with its customers in the integration and effective use of the software, helping them to realize clear cost advantages.

MAGMA's range of products and services includes the simulation software MAGMASOFT® autonomous engineering, for virtual designs of experiments and autonomous optimization of casting processes, as well as comprehensive engineering services for casting design and process optimization. Today, MAGMA's software is used by more than 2000 companies all over the world for cost-effective casting production, reduced quality costs and for establishing robust processes for all applications, particularly in the automotive industry and mechanical engineering.

With the MAGMAacademy, MAGMA provides extensive implementation and educational offerings for all topics associated with casting process simulation. MAGMASOFT® users, together with their colleagues and managers, learn in trainings, workshops and seminars how they can use simulation and virtual optimization for optimizing casting design processes, lowering production costs and increasing resource efficiency.

MAGMA Giessereitechnologie GmbH was founded in 1988 and is headquartered in Aachen, Germany. A global presence and support are guaranteed by offices and subsidiaries in the USA, Singapore, Brazil, Korea, Turkey, India, China and the Czech Republic. Additionally, more than 30 qualified partners represent MAGMA around the world.

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780 words, 4.958 characters including spaces

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