# Press Release of MAGMA GmbH

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Benefits for Users and Decision Makers – the New MAGMASOFT® 5.5

Efficient casting development, safe starts of production and robust production windows are the focus of the foundry industry. With this in mind, the new MAGMASOFT® Release 5.5 makes significant contributions for creating even more value in casting design, in toolmaking and in the foundry. Particular emphasis has been placed on further simplified and efficient use of the software and its results.


1513047_Pltr/v10
Solidification & Cooling, Temperature
4min 44.9s, 6.01 %
X-Ray: off
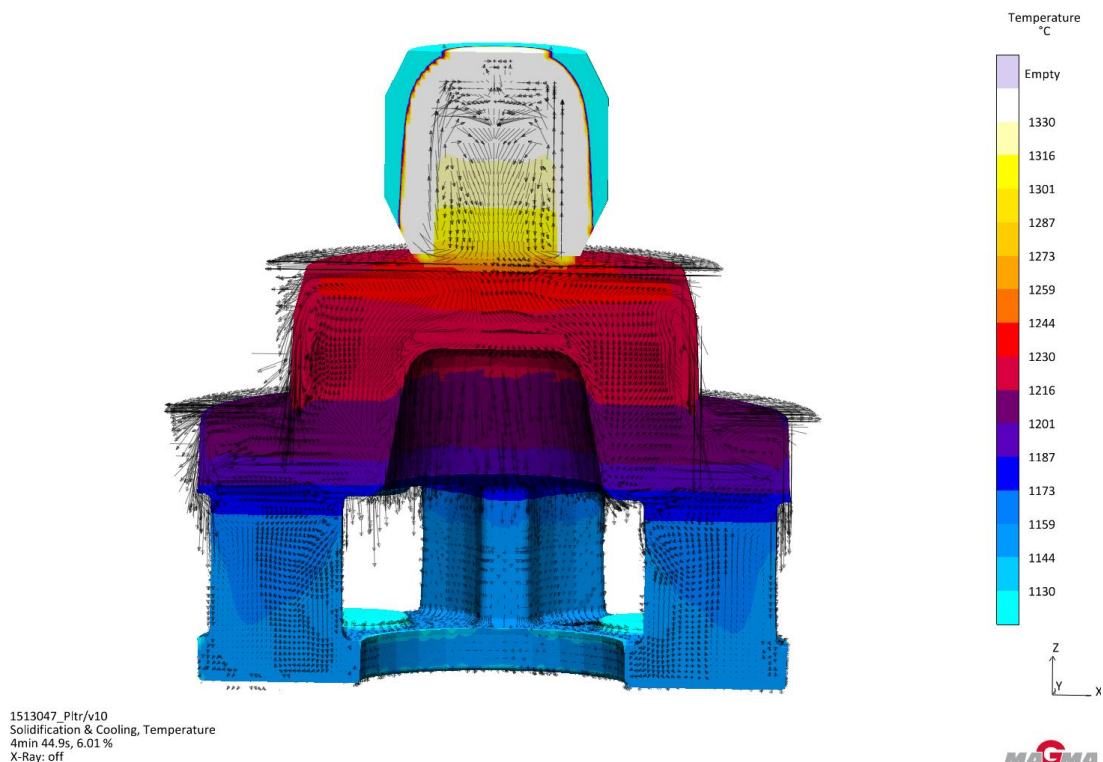
Thermal convection during solidification influences the feeding behavior

Cast Iron in Motion

Completely new capabilities are available to iron foundrymen to consider the effects of metallurgy and metal treatment on solidification and feeding behavior. With the innovative SMAFEE feeding algorithm, the influence of melt quality, inoculation practice and local pressure distributions on porosity development is even better taken into account. In addition, thermal convection during solidification is now calculated as a standard. The impact of the flow on the resulting temperature profile influences the feeding behavior both in large castings and in series castings. The new feeding model is available for all types of cast iron (grey, ductile and compacted graphite iron).

**Quality Assessment in Die Casting**

In high pressure die casting, casting defects due to gas porosity are major causes for scrap. Tooling and process design therefore focus very strongly on reducing porosity due to entrapped gases. In the new MAGMASOFT® release, the transport of entrapped air can be reliably predicted and allows consistent evaluation of the mass balance in the cavity throughout the filling process. The corresponding masses of gas as well as the effectiveness of the venting conditions can be determined quantitatively. This makes it possible to assess the quality of mold design and process conditions over the progress of the project.
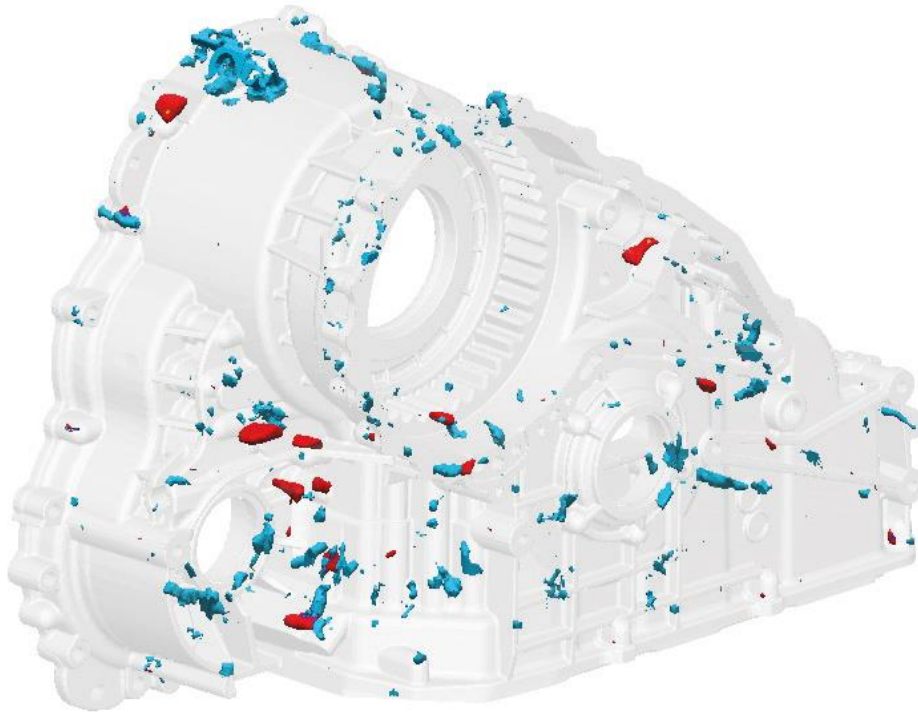
Direct evaluation of different casting defects in comparison with CT
(blue: air, red: shrinkage pores)

The Crooked Core

With the progressive necessity for lightweight designs and the resulting thinner wall sections, core-related casting defects due to distortion or core breakage are increasing. MAGMASOFT® 5.5 now provides for the first time the possibility to predict and avoid stresses in the core during filling and solidification. This allows to prevent casting defects due to core distortion or failure. Extensive material data is available for various core materials. In addition to cold-box cores, special attention has been paid to the behavior of inorganic cores. The unique capabilities provide increased security in avoiding core breakage, allow the prediction of local dimensional tolerance and enable the pre-compensation of core distortion through modification of core-box designs.
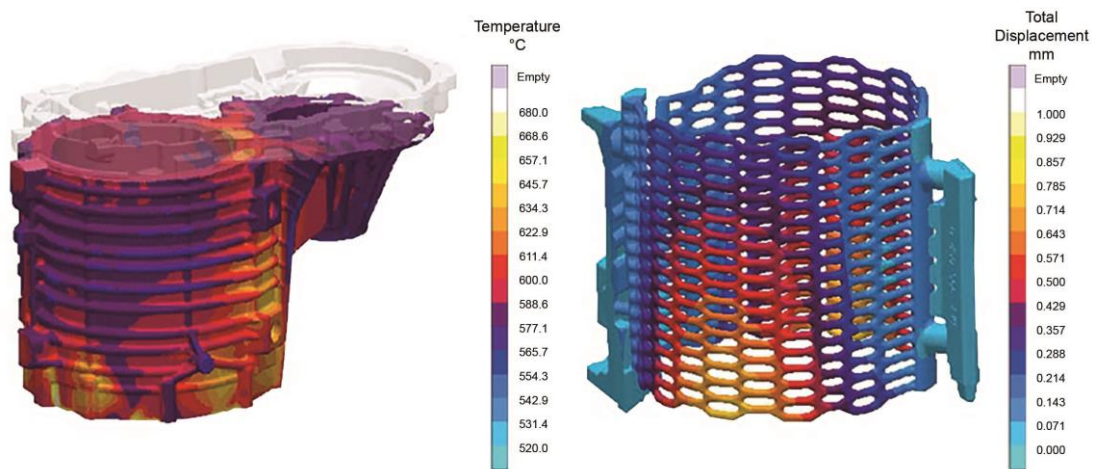
Core distortion during filling of an electric motor housing

Optimized Heat Treatment of Steel Castings

MAGMASOFT® 5.5 enables the optimization of heat treatment for a wide range of low and high alloy steel grades. This makes it possible to check whether the process conditions and the resulting local microstructure and mechanical properties of the component meet the customer's requirements. In addition to new results to assess cooling rates in critical temperature ranges, the program now takes into account the austenitic grain growth. A unique feature is the possibility to transfer the segregation-related local composition from the casting process to the heat treatment calculation.

MAGMA CC – Now Also Available for Steel

MAGMA CC can now also be used even more efficiently for all continuous steel casting processes. Numerous extensions are available for the optimization of the start-up process and for the thermal and mechanical calculation of the process – also for bow-type casters. The fully integrated capabilities for virtual designs of experiments and autonomous optimization allow the user to assess robust manufacturing conditions while ensuring material quality by monitoring inclusions or avoiding core cracks.

MAGMASOFT® 5.5 – Faster to the Goal Overall

The use of the software should support the user's daily work routine easily and effectively. The time to solution must be as short as possible. MAGMASOFT® 5.5 offers many improvements in usability to get to the required results faster and allows assessing them quantitatively. With the extended integration of MAGMAinteract®, communication and exchange of results within the company and with customers becomes even more self-evident.

MAGMASOFT® 5.5 thus offers diverse and new potentials for securing and increasing the efficiency of casting design, tooling layouts or production processes for both, users and decision makers.

Contact Details

Publication free, copies of appropriate citation requested. MAGMA Gießereitechnologie GmbH will not incur any additional costs as a result of the publication.

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