
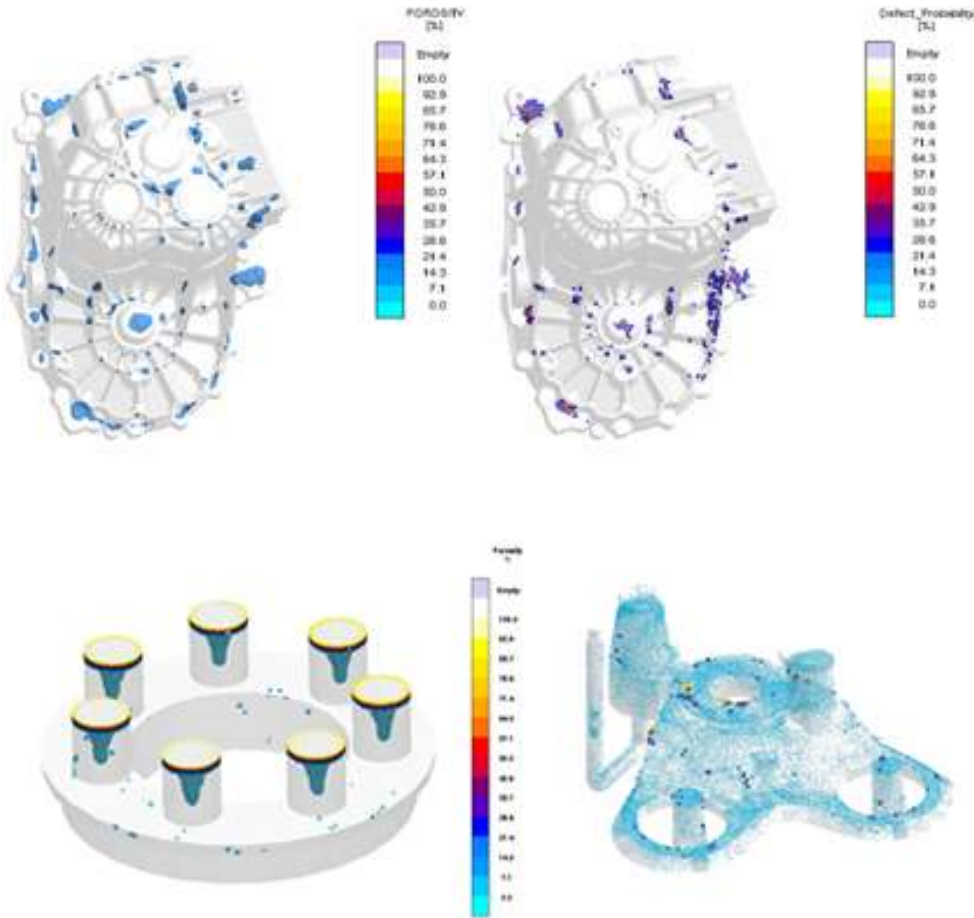





MAGMA News

Thailand Edition

5 Engineering
Casting Process Optimized

Issue No.: 6 February 2015

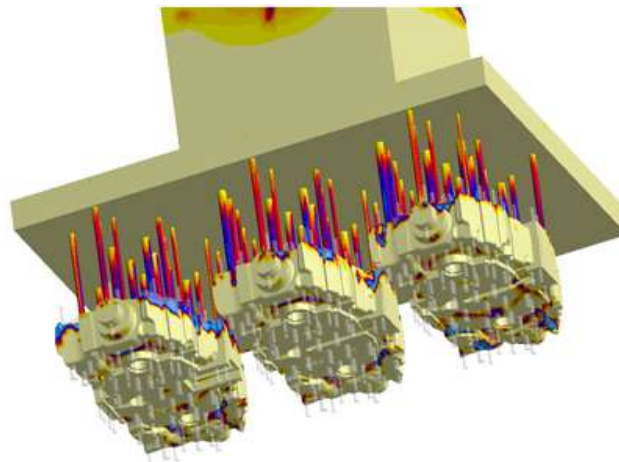
MAGMA Thai Newsletter	How does casting process simulation with MAGMA ⁵ help me?
<p>Do you want to publish an article or success story? info@m5engineering.co.th</p>	<div><p>Committed to Casting Excellence</p></div> <p>Simulating the casting process with MAGMA⁵ provides foundries with technological and competitive advantages that increase profits and aid in the optimization of the entire casting process. MAGMA⁵ helps foundries eliminate sources of wasted energy and wasted materials, which leads to lower manufacturing costs and lessens the foundries impact on the environment. Casting process simulation with MAGMA⁵ offers foundries opportunities for cost reduction and value creation throughout the entire operation. More information on the benefits can be found in the following website: www.magasoft.com.sg</p> <div></div>
<p>Events in 2015</p>	
<p>GIFA 2015</p>  <p>6/16/15 - 6/20/15 Düsseldorf, Germany 13th International Foundry Trade Fair with Technical Forum</p> <p>Thailand MAGMA User meeting 2015</p>  <p>Committed to Casting Excellence</p>	
<p>3/12/15 Dusit Princess Hotel (Sri Nakarin Rd. Bangkok) 2nd Thailand MAGMA user meeting. User presentations and new developments.</p> 	
<p>3/31/15 - 4/3/15 China Expo Complex (Shanghai Hongqiao), China</p>	

Core and Mold: Knowledge Counts! Core and Mold Simulation

Improvements are only possible when you systematically implement knowledge of the metal casting process. Simulation software from MAGMA is based not only on physics and mathematics, but also integrates a comprehensive database of knowledge. No information regarding a simulation project is ever lost – all results are quickly and easily accessible to by your employees for years to come



The quality of the cores and molds plays a significant role in the resulting casting quality. With increasing casting complexity, the production of cores and molds becomes a determining factor for casting manufacturing. Therefore MAGMA also offers software for core and mold production. MAGMA C+M is also available as a stand-alone application, independent of MAGMA⁵.



Core shooting simulation including shot cylinder for a multi-cavity core box

MAGMA C+M

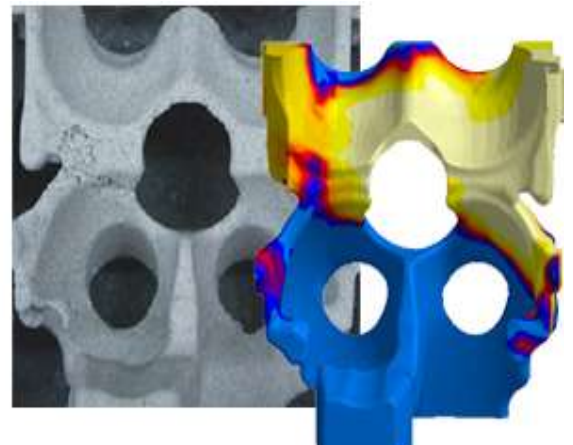
MAGMA C+M is available as a stand-alone core simulation software or as a functionally equivalent add-on module for MAGMA⁵.

As a powerful simulation tool, MAGMA C+M turns core production into a calculable and optimizable activity. Core shooting, core curing and the thermal control of core boxes can be analyzed to find the best solution.

MAGMA C+M supports core and mold manufacturers by offering:

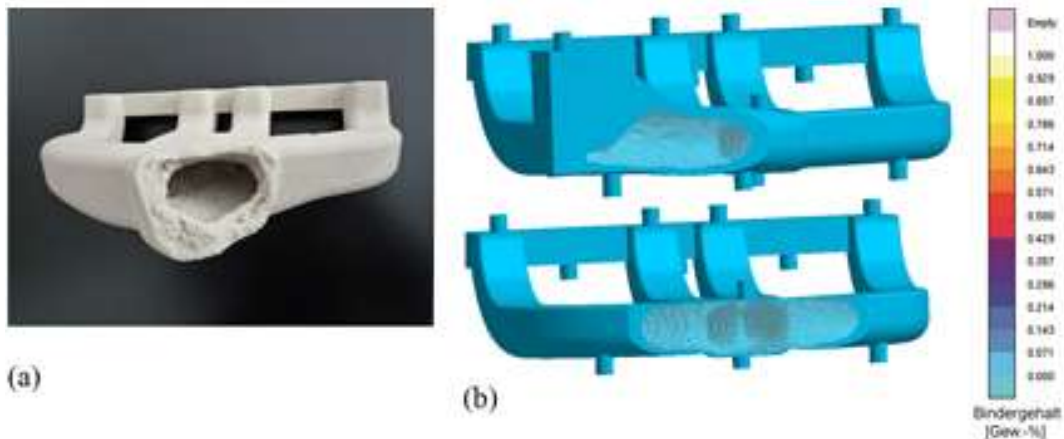
- Process transparency and feasibility evaluation
- Rapid construction of core shooting tools
- Reproducible density and sound sand cores
- Robust process parameters for production
- Reduction of material usage
- Reduction of development time to series production
- Economical and ecological production of cores

Real core and simulation: Analysis and causes of defect



MAGMA C+M offers:

- Robust prediction of the shooting behavior of complex cores for organic and inorganic binder systems
- Flexible optimization of nozzles and venting conditions
- Consideration of the shoot head
- Integrated simulation of shooting and curing behavior
- Gassing and purging and curing for cold box cores
- Layout and temperature control for hot core boxes
 - Prediction of the curing reaction for hotbox cores with organic and inorganic binder systems



Cured peripheral shell of a real core (a) and peripheral shell cross-sections at different positions of a simulated core (b). When the binder water content drops below a predefined value, the core is cured. The peripheral core shell can be examined at arbitrary positions.

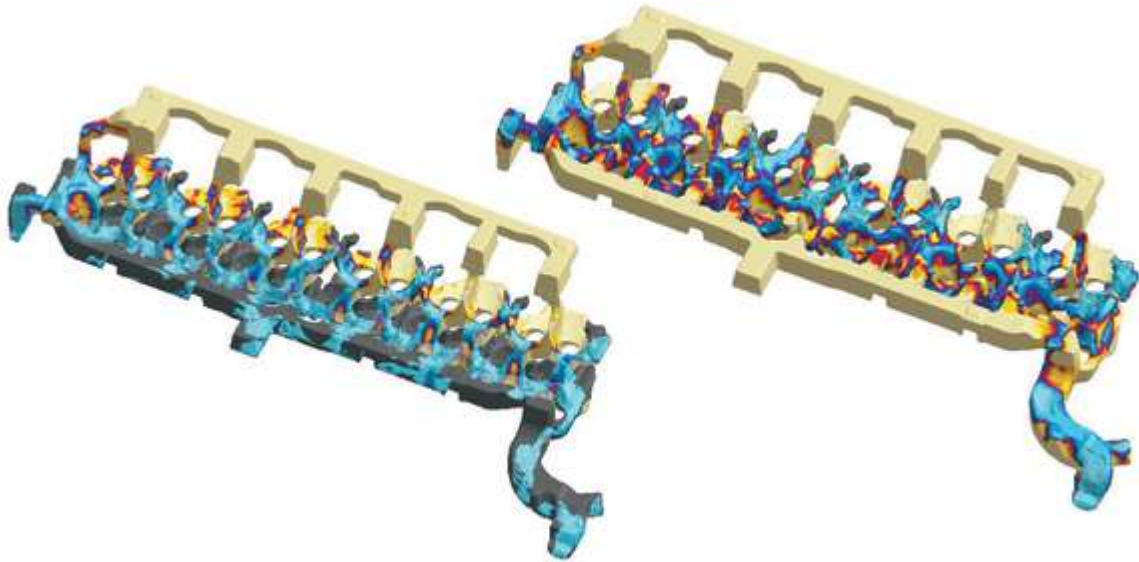
Core and mold sand simulation

With increasing demands on casting quality and a tendency to thinner-walled structures for high performance components, the production of the corresponding cores has become a limiting factor for casting quality and productivity. The lifetime of a core can be investigated using simulation to optimize the process and core layout.



Core shooting is the essential production process

The most important core production processes are core shooting and hardening of the binder. Using simulation, changes in core filling patterns and sand densities during core shooting can be virtually observed for different blow tube/vent configurations or shot pressures/times. By simulating the gasing of the core, the transport of curing gases like amine for cold box binders or the drying of inorganic binders can also be visualized for varying processing conditions. During the casting process, the binder pyrolyzes and emits gases. Simulation shows which pressures arise in the core during casting and where these gases are transported, whether into the casting to cause defects or into the atmosphere as a source of pollution. Sand simulation developments have now closed a missing link in the chain of casting process simulation.



Life-cycle prediction of foundry cores

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Thank You Kha



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