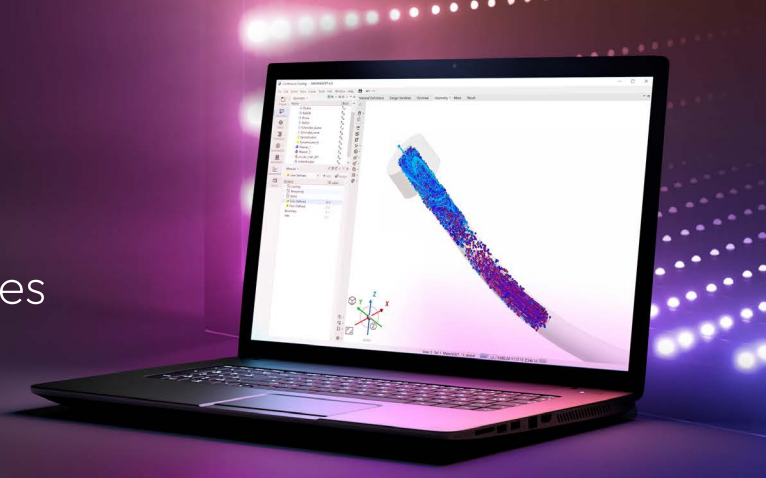
MAGMA CC 6.1
Highlights & New Features



HIGHLIGHTS IN MAGMA CC 6.1

MAGMA CC offers significant innovations for the simulation of continuous casting processes, enabling the precise analysis and optimization of the strand quality. With flexible casting speed control and an advanced turbulence model, users gain deep insights into the flow behavior and the mechanical influences during the casting process, which supports the identification of improvement potentials for process quality.

- **"Stop & go" control:** flexible variation of the casting speed, including pauses and return strokes
- **Detailed insights:** fast creation of a 1D profile of the simulation results for the entire strand length
- **Quantitative evaluation of inclusions:** particle counting for evaluating the inclusion displacement in different strands over the process time
- **Microporosity:** microporosity prediction by an optimized criterion
- **New turbulence model:** accurate description of the flow behavior in the launder, in submerged entry nozzles and especially in the sump area
- **Influence of the support rolls:** analysis of the mechanical influence of rolls on strand deformation and quality

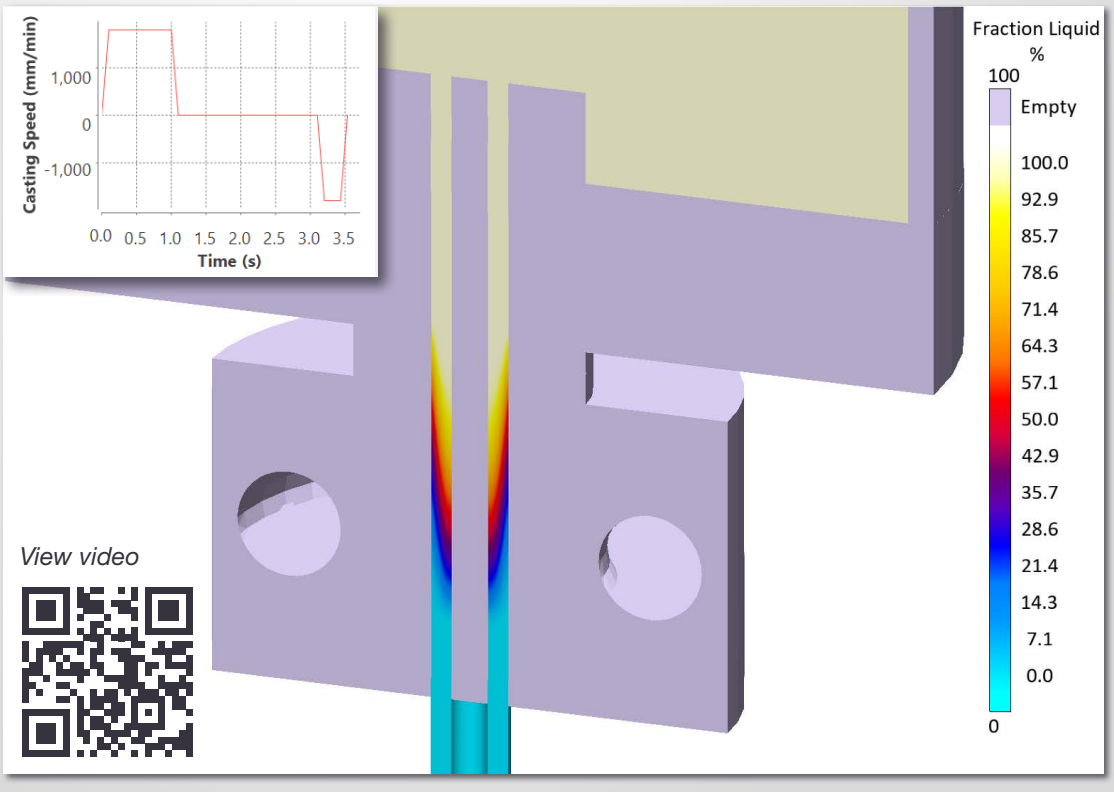
MAGMA CC offers significant innovations and enhancements for the simulation of continuous casting processes. The variable control of the casting speed enables the flexible mapping of "stop & go" cycles, including pauses, return strokes and cyclical movements in the withdrawal process. An advanced turbulence model precisely maps the flow behavior, and supports the analysis of the flow dynamics in continuous casting.

Mechanical influences, such as those caused by support rolls or the mold, can be examined in detail. Roller positions can be analyzed to evaluate their influence on the deformation of the strand. This makes it possible to identify potential causes of strand shape deviations and their effects on the strand quality.

In addition, a function for counting particles (tracer particles) allows analyzing how the melt is distributed across different strands via the casting system (launder or tundish). The extended capabilities of MAGMA CC thus provide new quantitative information on process-dependent strand quality and support users in the efficient evaluation of results.

"STOP & GO"

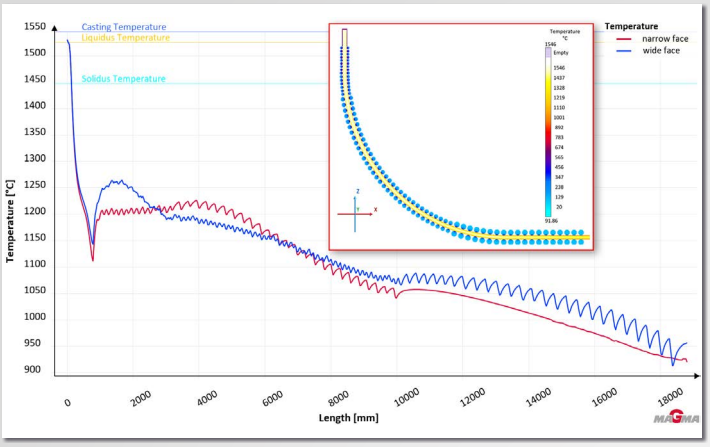
A flexible design of casting speed now accommodates pauses, return strokes and cyclical movements within the withdrawal process and simulates them. This "stop & go" cycle can be mapped across the entire withdrawal process, thus simplifying the analysis of complex process sequences.



Consideration of "stop & go" cycles during withdrawal

NEW 1D STRAND PROFILE DIALOG

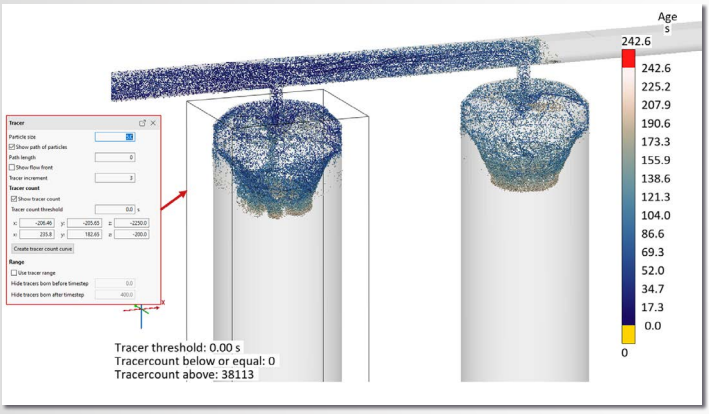
In MAGMA CC, it is now possible to create a 1D profile of the simulation results along the entire strand length with a single click.



Fast determination of 1D profiles along the strand

PARTICLE COUNTER

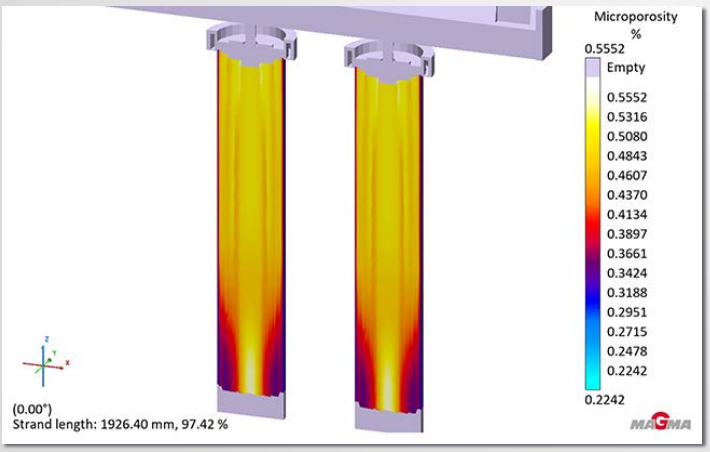
It is now possible to count particles (tracer particles), for example, to assess how many particles get into different strands via the launder or tundish. This result can then be displayed as a function of time. Moreover, the threshold value can be adjusted to compare the number of tracers generated before and after it.



Particel counter

IMPROVED 'MICROPOROSITY' CRITERION

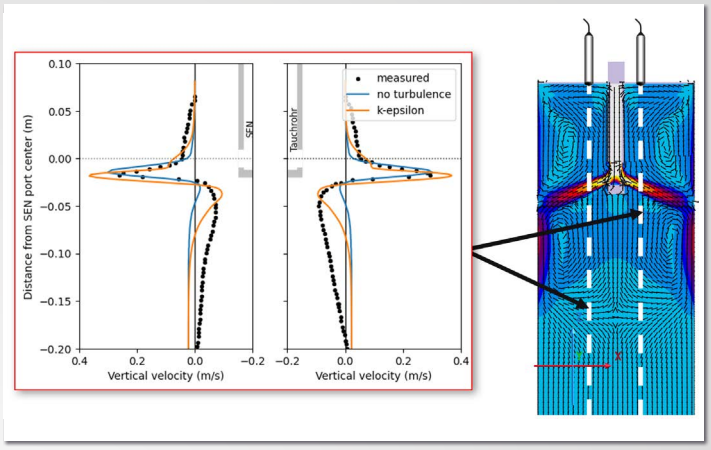
The existing 'Microporosity' criterion has been improved for even better porosity prediction.



Improved microporosity prediction

K-EPSILON RNG TURBULENCE MODEL

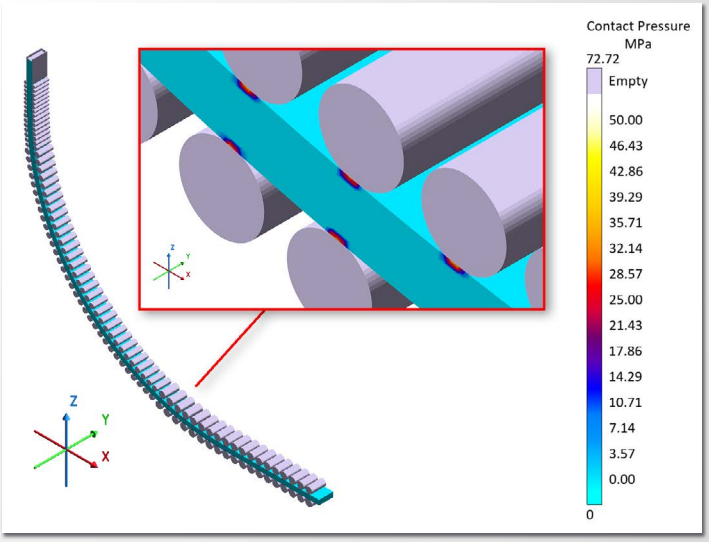
The turbulence model in MAGMA CC has been further developed to improve the accuracy of flow predictions, especially for high Reynolds number regimes typical of SEN or tundish. This provides deeper insights into the flow dynamics of the continuous casting process while improving the simulation accuracy.



Detailed modeling of turbulence in the mold with SEN

IMPACT OF SUPPORT ROLLS ON STRAND DEFORMATION

Another focus is on the detailed consideration of mechanical influences. MAGMA CC now makes it possible to precisely simulate not only the influence of the mold but also the influence of support rolls – especially in continuous steel casting. This enables users to better analyze how roll positions or other mechanical influences affect the deformation of the strand and, ultimately, the product quality.



Detection of the contact pressure applied by the support rolls to the strand