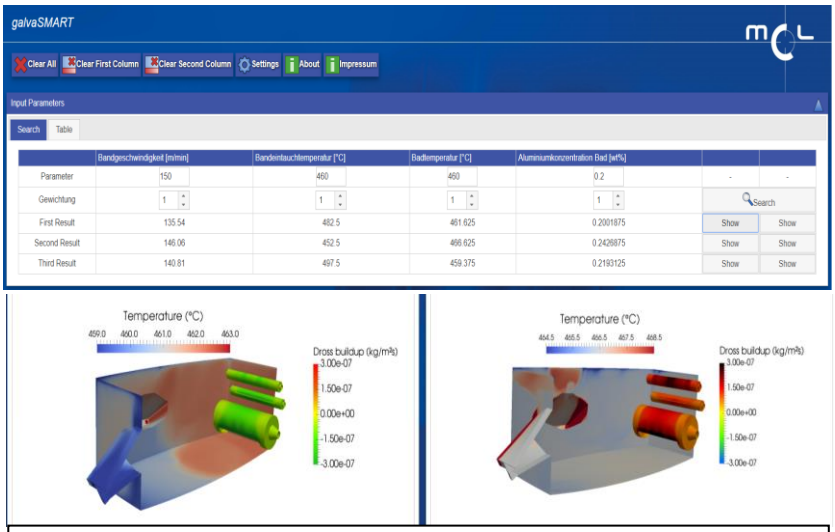
SUCCESS STORY

IC-MPPE
Integrated Computational Materials Process and Product Engineering.

Programme: COMET – Competence Centers for Excellent Technologies

Programme line: COMET-K2 Centre

Type of project: P3.3 GalvaSMART, 2017-2022, multi-firm



A typical graphical user interface of the galvaSMART software, © MCL

HIGH-END RESEARCH MOVES PRODUCTION

A MODEL EXAMPLE OF THE TRANSFER OF SCIENCE INTO APPLICATION

Easy access to information is the key to driving innovation in the knowledge society. But unfortunately, breakthrough results often get stuck in research departments because the interfaces and tools to distribute them broadly to the production base are lacking. To change this, galvaSMART, a software designed as a dynamic knowledge database, has been developed at MCL to bring insights from fundamental numerical simulations of the process to the control room of the production floor with just a few clicks.

The physical models of the process sequences, some of which have been developed over many years, provide a deep insight into the physical and chemical processes that determine both product quality, raw material consumption and productivity in the form of computer-aided simulations. This can improve day-to-day production and provide a tool for ongoing major innovation steps. However, the special basic know-how required to carry out and evaluate the simulations, as well as the associated computing times, which can sometimes take weeks, often make it difficult to make these solutions directly applicable to production on a broad basis. But it is precisely at the interface between science and practice that most synergies arise.

In cooperation with voestalpine Stahl Linz, the transfer of knowledge from high-end research to the production facilities was realized in a pilot project. Based on the digital representation of the hot-dip galvanizing process, dozens of different process parameters were analyzed and calculated at basic level in months of work. From the results, the relevant information could be extracted and stored in a visual

knowledge database. Operators of hot-dip galvanizing plants now have the possibility to display, analyze and compare different process conditions with just a few clicks. In this way, the scientific perspective is added to the practical knowledge already available, and new ideas for different process designs can be virtually compared with each other. But this should by no means be a one-way street. The ideas from production can be tested and evaluated by means of the digital model and the results obtained flow back into the knowledge database, resulting in a dynamically expandable system.

Impact and effects

The new knowledge database enables uncomplicated transfer of scientific findings to production and gives process-experienced engineers the opportunity to compare their experience with simulation results and develop new ideas. The intuitive and simple handling of the knowledge database contributes significantly to the democratization of knowledge and enables the acceleration of innovative ideas.

View of the control station of the hot-dip galvanizing line. In the foreground you can see the steel belt with deflection roller.
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Project partner

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- International Zinc Association, USA
- Montanuniversität Leoben, Inst. f. Thermoprozesstechnik, Austria
- Montanuniversität Leoben, Modellierung und Simulation Metallurgischer Prozesse, Austria

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