THE SAME GOAL

AT THE START OF THE YEAR the American company MSC Software acquired Simufact Engineering GmbH after years of collaboration. It is a union at eye-level, offering technical synergistic advantages to both. Simufact- CEO Michael Wohlmuth answered bbr’s questions about the motivations of the merger and their joint vision »Smart Factory« at the 16th Simufact Roundtable in Marburg.
Mr. Wohlmuth, the annual Roundtable is not the only thing happening right now here in Marburg, you are also celebrating 20 years of Simufact. Two decades, in which a lot has happened in the company, I take?

Over the last 20 years a lot has developed. Henrik Schafstall and I founded the company on May 1st, 1995 under the name Femotec engineering GmbH. Right from the start, we collaborated with the American company Marc Analysis Research Cooperation, using their software product Marc/Autoforge. Since then we have operated as an engineering services company for MSC Software in the German-speaking region. In 1999, Marc was purchased by MSC Software and the product Marc/Autoforge merged into MSC.Superform and MSC.Superforge. Starting in 2002, we began autonomously selling MSC products and ended up taking over the entire forming simulation business division from MSC Software in 2007. The products MSC.Superform and MSC.Superforge were re-launched under the name Simufact.forming. At this point, we were responsible for a product of our own for the first time, an entirely new experience for us.

Simufact.forming exclusively supports forming simulation. When was the welding process simulation added to the Simufact line?

A number of manufacturers from the German automotive sector were thrilled with the easy usability of our software for forming processes, while still being able to simulate complex manufacturing processes. Thus, they commissioned us with the development of simulation software for welding processes. We began with the development of Simufact.welding in 2006 and launched a marketable version of the welding simulation software in 2012.

In February 2015, the next step in the development of the company Simufact followed: the union with MSC Software. What where some of the reasons behind this intensified collaboration?

For a couple of years now, we have been expanding as a company both in terms of product variety as well as growing our team. It was a logical next step to enter into conversations with investors to realize these strategic steps more quickly. The talks with MSC Software came at a perfect time, as they were seeking out partners to expand their own product portfolio. Another reason was summarized by Dominic Gallello, CEO of MSC Software, when he said: «Too often, our customers tell me that poorly understood manufacturing processes result in products that don’t function as designed and simulated.» The customers themselves know, that the manufacturing process and the resulting properties are not considered in the final product. On this foundation, components are CAE-designed today and that is simply wrong.

In your opinion, what is the solution to this problem? Simufact looks at the manufacturing of a product. For us, the goal is to optimize the entire manufacturing process from semi-finished component to installation-ready product. MSC on the other hand only looks at the finished product, without the manufacturing process. We realized that both companies actually target the same goal: we want to develop CAE solutions that allow a product design to consider the manufacturing process. That was the main motivation through which we entered into more serious conversation.

You just mentioned that the merger made sense, because both Simufact and MSC have the same objective. Could it be said that the goal is to fuse product and manufacturing simulation and thus take a step towards «Smart Factory»?

That is our goal exactly and a strategyically important and central idea on the path to «Smart Factory». In the past, the product and manufactu-
ring worlds have often been viewed separately. The comprehensive IT penetration and linking of both worlds is the central subject of the future, which we want to address together with MSC. Thanks to the collaboration with MSC, the realization of the ›Smart-Factory‹-idea is now simpler and certainly possible sooner.

**How can one picture this linking of the two worlds? On what basis does communication happen between product and manufacturing simulation?**

Generally speaking, two options can be explored. One of them is simple file-transfer of result-data. In it the real geometry is included, which oftentimes has little to do with the designed geometry after manufacturing. With the strength distribution and microstructural distribution, we have all the information from the manufacturing process available to us. These values can be described in a ›Neutral-file‹, which can be read and interpreted by the target-system. The problem with these files is that some information cannot be processed, because it was not considered during the format development. You have to be aware of which file types and formats can be used. The other option is working with APIs, meaning the direct linking of the software. This way data can be processed online and direct access is possible, because the programs can directly work together.

Internally at Simufact we’ve already introduced a similar link by coupling Simufact.forming and Simufact.welding. Thus, we can calculate forming processes and then seamlessly weld the formed components.

**What advantages and opportunities have resulted from the merge of the two companies, also with regard to the linking of product and manufacturing simulation?**

It was important to both companies to continue to drive the simulation of entire process chains through our intensified collaboration. This is possible, because we now have access to more MSC technology than before the merger. MSC on the other hand can benefit from us as a technological leader, as we are able to visualize every possible degree of complexity in processes, thanks to the strong Marc-solver, which we have been using from the start. Furthermore, we can now represent ourselves differently on an international level as a strong partner of the American company MSC Software. We can build on the entire sales network and international presence of MSC. That is exactly what we were lacking.

**Are there also customers, which push for process chain simulation?**

ZF, for example, is a customer supporting us in this area. They realized that errors in the structural analysis occur when the forming history isn’t considered. We did a classic forming simulation, transferred the results to a structural analysis and observed the behavior under load. This led to completely different results that matched the trials they had completed.

**Has your collaboration already produced results?**

We do have individual findings, but we are still in the pre-study phase. We still have to, for example, clarify which physical values have to be transferred from the manufacturing side into the product calculation and which have no influence on the finished product. This means that the manufacturers are communicating with the product developers and deciding what information each side requires to optimize the process chain. Exactly, in this area we often need to lend development aid. This communication has to happen across several divisions of companies and on the level of calculation, many manufacturing leaders and product developers are still not communicating. Last year, I did a talk at the Auto-motive Circle. In 2014 the heading of this communication platform for the automotive and supplier sector was ›New strategies in car body construction‹. In my presentation, I theorized that: Should we truly want to advance the idea of a ›Smart Factory‹, everything needs to be connected. Yet oftentimes, individual software firms are reluctant to collaborate with everyone or open themselves up in certain areas. It’s still a long way on the road to closer networking.

**In which areas have advancements been made by Simufact thanks to the support from MSC?**
In computation speed and robustness, two topics that are always of great importance in manufacturing simulation, we have already been able to make improvements.

**What are current problems in the area of robustness?**

On the topic of robustness I can offer an example from mechanical joining. Here, we have the problem, that both the sheet metals and the joining elements have their own properties. Today, the two elements are not only clinched or punched together, but oftentimes also secured with an adhesive layer. Due to this layer, the pre-fixing has to be considered before the mechanical joining element is added, in addition to the adhesives’ own structural properties. In such a complex theoretical model the main dilemma is robustness. What we are doing now with our colleagues at MSC, is establishing our customary stability at a new and higher degree of complexity.

**To what extent have advancements been realized in terms of computation speed?**

In 2013 we needed several weeks of calculation to virtually weld an entire car door. When automobile manufacturers have to wait three weeks for a result, it is actually faster to destroy a real door. Nowadays, a car door is calculated within a day, a physical experiment can’t be done any faster. We have made significant advancements in speed since February. Our customers will feel this, albeit with a small delay, in the next release in the coming year.

Surely, you had certain expectations going into the merger. Have any of the expectations on your side been met already?

Our expectations have been met regarding our influence at the international market level. This is currently being realized and has produced excellent results. It was driven with such force in-house at MSC that we are actually quite surprised at the speed it has picked up. On the technological side we are very happy with the consistency with which the MSC-developers are now working with us on topics that are our focus. I would not have expected the consistency and flexibility of support we continue to receive. It has more than exceeded our expectations.

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