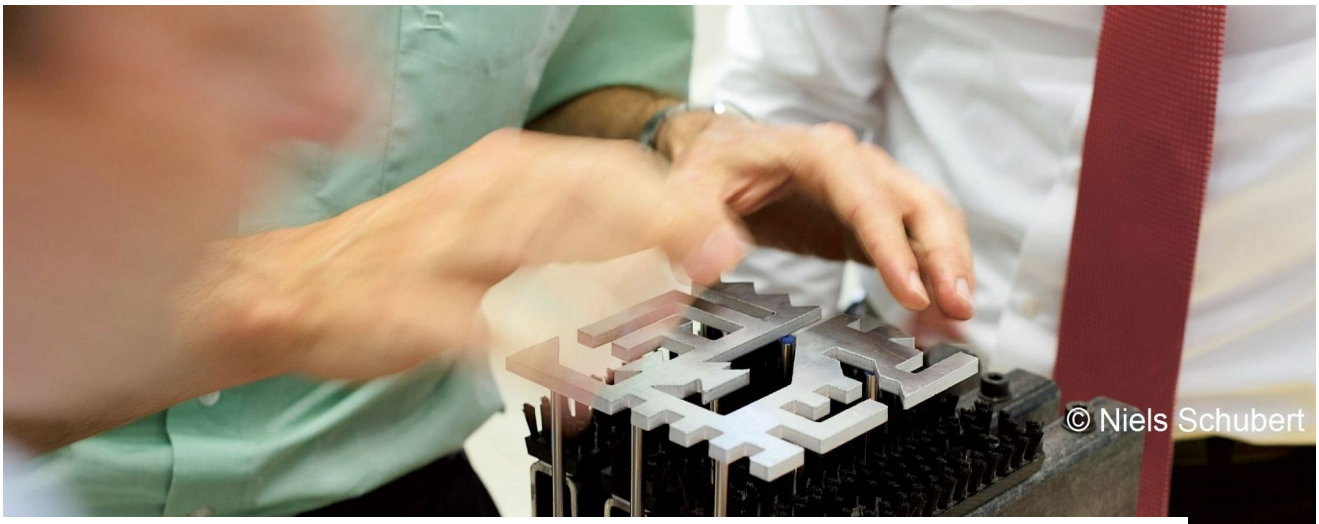


CATHARINA DAUM

Can´t be done? Oh yes it can!

With openness and a pioneering spirit, TRUMPF engineers developed the first laser machine that can handle the entire machining process – from raw sheet metal to fully sorted parts. The TruLaser Center 7030 isn't merely a new iteration, it's a completely new machine – and an extremely efficient one, at that. We spoke with three developers from the team that created this revolutionary machine.

Felix Riesenhuber, Peter Epperlein and Jens Ottnad were heavily involved in designing, developing and implementing the new TruLaser Center 7030. In an interview, they spoke with us about the highs and lows of the past few years and told us what it takes to develop such a novel product.

How and when did the TruLaser Center 7030 project come about?

Felix Riesenhuber: TRUMPF had long wanted to develop the next generation of laser-cutting machines. The initial idea for the TruLaser Center 7030 emerged in 2012, and the project was officially approved in 2014.

What was so special about the project?

Peter Epperlein: We knew going into it that we would have to question existing development methods if we wanted to achieve a true leap in innovation with this mature technology. That's why we fundamentally shifted our perspective – away from current machine design and toward an unobstructed view of our customers' production tasks.

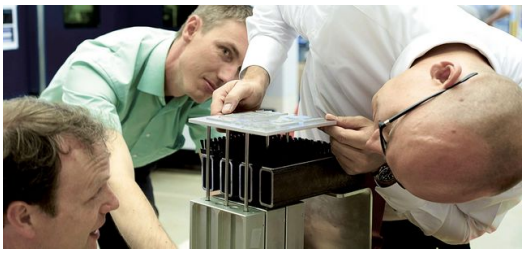
In other words, you not only developed something new, but you did it in a new way?

Epperlein: Exactly. Of course, it was a brilliant idea that sparked this radical new development. But to achieve overall success we needed lots more ideas, and these had to specifically tackle the problems we were facing. The novel aspect was that all specialist departments worked in parallel and agreed on things among themselves in very short intervals. It was the first time we had applied agile methods across the board in a mechatronics project.

Riesenhuber: We also formulated clear efficiency and process reliability targets for the machine, and used these to assess each development stage.

How did you do that specifically?

Riesenhuber: We had to make productivity measurable, and we had to do it using real parts under real production conditions. To that end, we developed standard sheet layouts that model the range of parts our customers use. Customers from a variety of industries helped us with this by providing several hundred set-up plans, which we then analyzed statistically based on a variety of relevant parameters. The result was a representative production program – the "original standard" by which we measured productivity, production problems and the impact of those problems. This standard made it possible, for the first time, to model the existing technology and to evaluate new ideas from our customers' real production perspective. And even more importantly, it enabled us to define, in the design phase, the permitted costs of the solution and its performance in the part program. Our firm goal for this was to achieve savings of 15-30 percent in machining costs for our customers, and every solution had to be measured against this goal.



Felix Riesenhuber, Peter Epperlein and Jens Ottnad (f.r.t.l.) were heavily involved in designing, developing and implementing the new TruLaser Center 7030. (Picture: Niels Schubert)

The team of people from the product group, development, purchasing, production, sales, service and project organization departments meets at regular intervals to discuss how development on the TruLaser Center 7030 is progressing. (Picture: Niels Schubert)

That sounds like hard work …

Jens Ottnad: It's fair to say that team effort won out over the lone genius approach of the past. That said, we needed to have geniuses on the team – otherwise we never would never have achieved our goal. The development team's creativity was directed at a shared goal, resulting in the success you see here.

And how big was the team?

Ottnad: The TruLaser Center 7030 core team is made up of more than 100 employees from the service, sales, product group, development, purchasing, production and project organization departments. It was only because of this manpower, and because everyone at TRUMPF was fully behind the project, that we were able to turn our ambitious plans into reality. We also had a strong program management that was very effective in coordinating all these different departments to achieve one goal, and in turning an extensive portfolio of individual highly innovative development projects into this marketable product.

Going into the project, did you realize how innovative this machine would be?

Epperlein: Well, the job defined in the technical specifications was clear, really – we essentially had to solve all of our customers' problems and turn the laser-cutting world upside down! Many were skeptical at first, but then when we saw how the first solutions performed when applied to the functional model, and when we discovered we could reliably automate the cutting process for parts of unprecedented complexity, we knew we were working on something really big!

You managed to realize the TruLaser Center 7030 in just two years – an extremely short time for such a herculean task. Did you suffer any setbacks?

Ottnad: We first tried to combine proven processes in new ways, but we quickly realized that this wasn't enough, so we started over again from scratch. We didn't want to accept any compromises. This radical step was difficult in the beginning – and of course there was a lot of pressure. With every additional design cycle, the plans became more and more definite. We broke out of our comfortable routines and were unusual ideas, and we developed completely new technologies whenever the state of the art offered us no solutions.

What are the biggest advantages of the TruLaser Center 7030 over conventional laser-cutting machines?

Epperlein: There are essentially three core innovations that make the machine unique. First there's the flat workpiece support with the SmartGate, which adjusts flexibly during the cutting processto widely varying parts, and machines them extremely quickly and reliably. Then there's the SmartLift, with its more than 150 pins, which achieves extraordinary removal forces of up to one ton of parts from the scrap skeleton. And to complete the picture, there's the SortMaster Speed, which absorbs these forces in a controlled manner and, with its more than 2,500 mini suction devices, quickly and reliably unloads all kinds of parts, from those with delicate contours to those with large surface areas. This makes the TruLaser Center 7030 the first 2D laser machine that can handle – and automate – the entire machining process. From loading and cutting to unloading and sorting finished parts, everything is integrated in a single machine, and the program is largely automated.

Was there an "aha moment" during the development phase?

Ottnad: It was overwhelming just how much creativity, selfless commitment and team spirit people's enthusiasm for the projectawakened. The excitement didn't let up until the machine cut a piece of sheet metal for the first time. That filled me with great pride.

Riesenhuber: The existing idea behind the flatbed laser machine hadn't been modified in more than 20 years. We'requite certain that this machine will change the world of laser machining forever!

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