ATHANASSIOS KALIUDIS

“We make Industry 4.0 easier to grasp”

Sheet metal processing companies ask themselves: What benefit do I have with Industry 4.0? TRUMPF and the Fraunhofer IPA simulate a test lab and give answers. An interview with Ulrich Schneider from Fraunhofer IPA and Eberhard Wahl from TRUMPF.

Mr. Wahl, everyone’s talking about Industry 4.0, yet people in sheet metal processing still seem to find the whole topic rather hazy and ill-defined. Why is that?

Wahl: I think there are two reasons why people are reluctant to embrace Industry 4.0. First, digitalization leads to changes in your existing processes and business models, some of which can be fairly major. That can scare people off. And second, right now our customers are managing quite well with minimal digitalization, so they obviously wonder why anything should change. They tackle the challenges they’re facing with lots of manual processes and expert knowledge, and do so successfully. But they’re gradually reaching the limit of what is actually feasible, because market requirements are constantly changing. Besides dealing with high manufacturing complexity, our customers also have to demonstrate an extraordinary degree of flexibility. Their customers are increasingly placing orders at the last minute, and sometimes they don’t even know what they’ll be producing tomorrow. That’s where process optimization with Industry 4.0 tools can really help. But until our customers actually experience the positive changes that stem from connected manufacturing, it’s hard for them to imagine what’s possible.

Is that where simulations and the sheet metal test lab at Fraunhofer IPA come in, Mr. Schneider?

Schneider: Absolutely. We’ve worked with TRUMPF to develop and build a range of demonstration setups that represent the various technologies used in sheet metal processing. For example, we can show visitors a sorting table for a laser processing machine, where we test how long it takes a worker to sort the metal sheets.

The simulations we run in this test environment reveal how supporting measures such as a new tool or an automated process can have an effect on the overall production process. Visitors get a chance to see exactly what happens when the sorting process goes faster and what impact that has – not just on the machine, but also on the subsequent process steps. They can see whether materials are piling up next to a machine because the previous batch isn’t finished. And they can see what you can do to prevent that happening so that your production process runs more efficiently and smoothly.

Ulrich Schneider from Fraunhofer IPA and Eberhard Wahl, who heads up product management for flexible sheet metal processing at TRUMPF, are working together in the flexible sheet metal processing lab to develop innovative solutions for the manufacturing technology of the future. Picture: TRUMPF / Fraunhofer-Institut

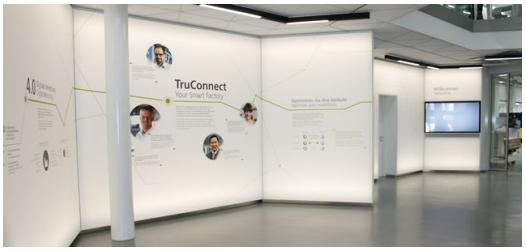
What basis did you use for developing the simulations?

Wahl: We drew on the expert knowledge we had accumulated in our numerous visits to customers worldwide, but we also spent a day each at 25 different production sites run by customers we chose as a representative sample. Based on our findings, we were able to create several examples of production systems that fairly accurately reflect what many customers experience.

Schneider: These production systems form the basis for simulations that mirror real-life sheet metal processing very accurately. And the 3D visualization of the simulations makes Industry 4.0 and its advantages and opportunities easier to grasp and appreciate.

Surveys suggest that 80 percent of the potential for optimizing a sheet metal processing line is found in the upstream and downstream processes. That sounds promising, though you can't help wondering what's going wrong at the moment?

Wahl: It's not that anything's going wrong, it's just that things could be going better. We're not saying that people who incorporate TruConnect into their production line should expect to see their processes optimized by 80 percent just like that! It's more of a gradual process. In the initial step you can maybe exploit 10 to 15 percent of the available potential, but then further improvements will require carefully tailored second and third steps. That's why we take such a close look at each customer's processes when we offer advice on TruConnect as part of Industry 4.0, analyzing exactly what improvements can be achieved with which methods, and where those improvements will show up. And we never lose sight of what impact these changes will have on other parts of the production process.



Welcome! TRUMPF completely renovated their demonstration center in Ditzingen and converted it into a kind of "TruConnect World". Picture: TRUMPF

And can people actually see what tools Industry 4.0 offers at Fraunhofer IPA?

Schneider: Yes. The flexible sheet metal processing lab is part of the Stuttgart Technology and Innovation Center, or S-TEC for short. Members of this innovative research campus include Fraunhofer IPA, other Stuttgart Fraunhofer institutes, Stuttgart University and its affiliated institutions, and various regional and national industrial enterprises. Besides the flexible sheet metal processing lab, the Industry 4.0 Application Center also features numerous highly instructive demonstrators that visitors can have a look at.

Wahl: On top of that, we've completely renovated our demonstration center in Ditzingen and converted it into a kind of "TruConnect World." We want to introduce our customers to the abstract topic of Industry 4.0 and give them an opportunity to prepare themselves in plenty of time for the challenges that lie ahead. Our goal is to enable them to act

instead of just react. And we hope that providing greater insights into this topic is the key to getting our customers more enthusiastic about connected manufacturing.

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ATHANASSIOS KALIUDIS
SPOKESPERSON TRUMPF LASER TECHNOLOGY

TRUMPF MEDIA RELATIONS, CORPORATE COMMUNICATIONS