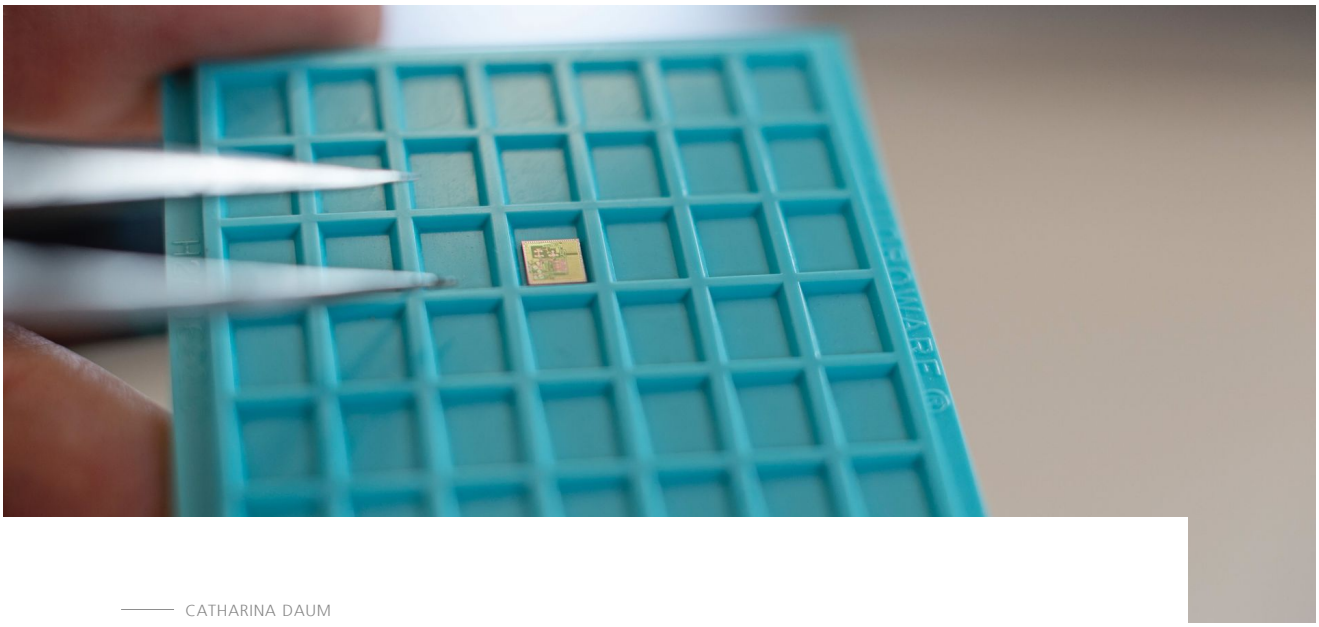


CATHARINA DAUM

007 in sheet metal production: Indoor GPS locates parts with centimetre precision

The French start-up BeSpoon aims to simplify production processes with innovative software solutions. One of these is the so-called "indoor GPS", which locates products with an accuracy of just a few centimeters.

"For things to remain the same, things will have to change." Jean-Marie André's favorite quote from Giuseppe Tomasi di Lampedusa's novel "The Leopard" reveals a lot about BeSpoon's CEO. "Change is the key to staying ahead of the curve. As an engineer and innovator, I see progress as my closest ally." Headquartered in Le Bourget du Lac, the French start-up BeSpoon has set itself the task of simplifying production processes using innovative solutions. One of its most inventive solutions is a form of "indoor GPS". Using GPS in enclosed spaces has never been a realistic option because satellite signals struggle to pass through thick materials such as walls – but now BeSpoon has found a way around that problem. The company's locating devices, known as satellites, can locate products down to a few centimeters. That is a groundbreaking development, and it confirms BeSpoon's status as a pioneer in efforts to determine the location of objects inside buildings and production environments.

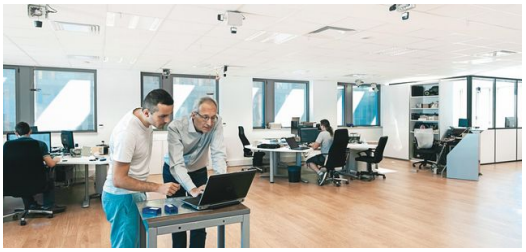
Positioning made easy

The French research lab CEA LETI had already been working on the concept of indoor GPS for ten years when the researchers decided to approach BeSpoon's founders to suggest embarking on a collaborative project in the year 2010. The basic idea was to make a novel use of radio waves to measure distances accurately in enclosed spaces. "We published our research results in a study, and when somebody at TRUMPF read it, we were suddenly on their radar," says André. In 2017, TRUMPF acquired a 60-percent stake in BeSpoon. Prior to that, Jean-Marie André hadn't even heard of the Ditzingen-based machine maker. He and his colleagues had been busy focusing on applications such as tracking athletes on court, for example during basketball games. Back then the French company had no idea that their indoor tracking system had the potential to eliminate

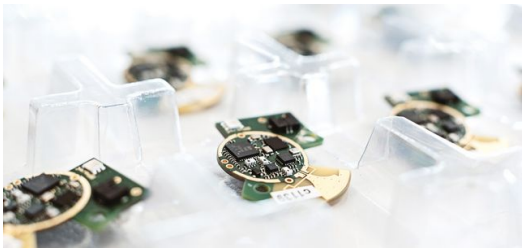
a major time-waster from many sheet metal fabricator's shop floors – the tricky task of locating parts.

No more hide-and-seek

Low-volume jobs make up an increasing proportion of the sheet metal fabrication business. Many job shops are finding it harder than ever to keep track of which stage each job has currently reached and where the parts are stored between stages. Yet transparency is essential to keeping things running smoothly, especially when dealing with urgent orders that have tight deadlines. "Metal and radio waves are not a great mix. That's why indoor positioning in the sheet metal fabrication business has never really been an option. But our product changes that. By using high-precision yet robust ultra-wideband radio technology, or UWB, we can track objects even when they are surrounded by lots of metal."



Headquartered in Le Bourget du Lac, the French start-up BeSpoon has set itself the task of simplifying production processes using innovative solutions. – Niels Schubert



Ever smaller chips: A crucial part of the process. – Niels Schubert



Prototype: What the markers looked like during the test phase. – Niels Schubert



Marker: Users can transfer the order number and other information digitally onto the e-ink display of the marker. They can then simply place them on or beside the parts of the order.



Satellite: Satellites installed in the production facility pick up the markers' location and transmit the information to an industrial PC.



This enables sheet-metal manufacturers to track orders, load carriers and means of transport and thus optimize processes.

Simple, yet groundbreaking

The way in which their indoor positioning software works is fairly simple to explain. First, the company installs several of its satellites in the production facility in order to provide a means of determining each part's precise location. Little boxes

containing transmitter chips – also known as markers – can then simply be attached to whatever object needs to be tracked, a cut metal part for example. The tiny chip in the magnetic marker box communicates with the satellites in the facility, allowing them to determine its position. Users can simply place a marker on, or next to, the parts they wish to track. "Sheet metal fabricators have to label parts with a data sheet or job sheet anyhow, so they can simply use a marker to hold the sheet in place," says André.

At EuroBLECH, TRUMPF made its first ever large-scale presentation of the localization solution it developed with the support of BeSpoon. Tests have already run at TRUMPF's smart factory in Chicago. BeSpoon sees one of its key tasks as building bridges between the digital and analog worlds. The fact is that machines are steadily becoming faster and more efficient – and the staff can't always keep pace. That's why this new positioning technique represents a particularly big step in non-automated production environments, says André: "We give people the tools they need to be as efficient as robots."

BeSpoon employs 15 people, almost all of whom are engineers. TRUMPF's decision to invest in the start-up ushered in several changes for the better: "This collaboration has changed the way we think, and the way we work. Obviously we are focusing more on sheet metal fabrication, but at the same time TRUMPF has opened up a wealth of opportunities we simply didn't have before. For example, now we can work with suppliers who would previously have regarded us rather skeptically due to our diminutive size," says André.

Forging links through change

TRUMPF has also shown the courage to change. "TRUMPF had virtually no experience working with chips as small as the ones we use. But they didn't shy away from making that transition. In fact, they embrace change as an opportunity to help their customers push ahead with digitalization and gain a competitive edge. That's why the company is so open to working with start-ups like us. And that's an attitude I find very refreshing," says André. Even though TRUMPF is so heavily invested in BeSpoon, that doesn't mean the start-up will be working exclusively with the sheet metal industry, says André: "Our partners are constantly encouraging us to discover new things. And that includes conducting research in other areas and keeping our creativity and sense of curiosity very much alive!"



Jean-Marie André

Jean-Marie has more than 20 years of experience in consumer electronics and communications. He was fortunate enough to start developing GSM phones in 1994 and to observe the development of this industry until 2009. During this time, Myriad took over Purple Labs, the design house he co-founded in 2001. As COO at Purple Labs, he was responsible for raising capital and acquiring customers, driving roadmaps and ambitious projects. Jean-Marie holds a Master of Science from ISIAL with a major in Artificial Intelligence.



CATHARINA DAUM
TRUMPF STYK S MÉDIAMI, TLA□OVÁ REFERENTKA