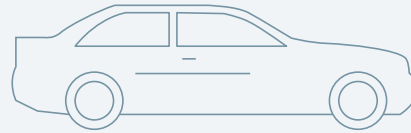


Gusts of wind detected,  
flight stabilized



Fuel consumption reduced

## Getting Everything **Flowing Nicely**

Kurzfassung · Langfassung: [www.tum.de/faszination-forschung-26](http://www.tum.de/faszination-forschung-26)

### Wenn es einfach gut strömt D

Im Windkanal bei BMW überlegte TUM Studentin Katharina Kreitz, wie viel besser man mit Sonden messen könnte, die perfekt auf die jeweilige Anwendung in punkto Form, Material und Dimension zugeschnitten wären. Warum also nicht selbst Sonden herstellen? Mit einem Partner gründete sie die Vectoflow GmbH, die überall da tätig ist, wo etwas strömt – ob Turbomaschinen, Flugzeuge oder Drohnen. □

**Whether you need to make a racing car faster, get a family car to consume less fuel or stabilize a drone in flight, knowing the flow behavior of your product will allow you to improve it. With its 3D-printed probes, Vectoflow has shaken up the niche market for pressure-based measurement technology.**

**A**ll theory is gray, according to Goethe. Katharina Kreitz was a Mechanical Engineering student at TUM specializing in aviation, gas dynamics and astronautics. Wanting more than just to sit in lectures acquiring knowledge, she juggled her degree with jobs at several companies, where she mainly worked on the test bench. In the process, she realized that the niche market for pressure-based measurement technology was dominated by one company located in the United States. And, as often happens when a single player is virtually monopolizing a market, good service and custom-made products were hard to come by. Sitting in the wind tunnel at BMW while working on her Master's dissertation with her then supervisor Dr. Christian Haigermoser, the two found themselves thinking how much better you could measure if you had probes whose size, shape and material were tailored perfectly to their respective application. So why not manufacture probes themselves?

Link
<a href="http://www.vectoflow.de">www.vectoflow.de</a>



Speed improved: better balance  
between lift and downforce

No sooner said than done. The pair approached a world-leading provider of industrial 3D printing technology and designed a probe for metal 3D printing – a product that they felt many companies would definitely be interested in. So why not found their own company to produce these probes?

No sooner said than done. They decided to apply for an EXIST Business Start-up Grant. Awarded by the German Federal Ministry of Economic Affairs and Energy, this year-long grant covers the salaries of people looking to set up a business as well as their material expenses and coaching costs. The idea was very well received. According to the award criteria, however, one of the members of the start-up team needed qualifications in business administration. Although a job advert posted online attracted a lot of interest, none of the applicants seemed suitable. “Starting a business is like a marriage,” says Katharina Kreitz. “It all has to fit perfectly.” So why not acquire the business administration skills herself?

No sooner said than done. Without further ado, Katharina Kreitz launched herself into a ten-month international MBA at the Collège des Ingénieurs, attending lectures in Paris, Munich, St. Gallen and Turin. The grant was secured, and a 3D printing company came on board as an

investor. And so Vectoflow was launched in 2015. The start-up’s website attracted the attention of people involved in Formula 1. Always working to improve their racing cars, they invited the team in for a discussion. This resulted in their first-ever order: to design a probe with three heads, a small-scale “measuring computer” for wind tunnels.

### Customized, precise, integrated

Five years down the line, Vectoflow is on hand wherever anything is flowing – be that in wind turbines, turbomachinery, planes, drones, cooker hoods or hairdryers. In a nutshell: “Whenever something’s moving, we’ll measure it,” Katharina Kreitz says. This is because, the more manufacturers know about flow behavior, the better they can design their aerodynamics to be. As for the F1 engineers, they can improve the speed, the balance between lift and downforce and the resistance of a racing car. Family cars can be optimized to consume less fuel, while drones can be stabilized in flight, as the probes detect gusts of wind in advance before making sure that the drone’s components are perfectly aligned.

Thanks to 3D printing, the probes are tailored specifically to the customer’s requirements, meaning that they also deliver more precise measurements than their predecessors. The algorithms they use are more accurate, while interfaces enable the software to be integrated into the customer’s IT system. No competitor product can do all of this. In other words, Vectoflow has really shaken up this niche market.

Vectoflow currently employs 15 members of staff and serves customers in some 70 countries via an international network of distributors. The team have retained close links with TUM, where they have made use of many services available to start-up entrepreneurs. In MakerSpace, for instance, they still use the laser cutter to apply serial numbers to their probes. TUM provides a lot of student trainees, some of whom have already been taken on permanently. The company is planning to set up its first subsidiary in the USA in the coming year. In the future, Vectoflow wants to be the go-to provider for measurement technology for customers all over the world.



*Gitta Rohling*