> Stephan Fetzner: »It quickly became clear to me that we were on to something special!«

>> »We're also seeing the market trend towards smaller devices in the area of stationary vehicle test benches,« says Fetzner. »Clients are looking for compact solutions here, too.«

»The devil is always in the detail«

Fraunhofer IPM is commissioned by AVL Emission Test Systems GmbH to design exhaust gas measurement systems for use during engine development. The work focuses specifically on the measurement of nitrous oxide. The two partners have been running development projects together for over eight years, and during this time have also branched out into the fields of trend analysis and technological forecasting. Stephan Fetzner leads the team in charge of developing device control and analytics systems at AVL Emission Test Systems GmbH in Gaggenau, Germany.

Mr. Fetzner, what does AVL ETS do exactly?
At our site in Gaggenau, we develop and produce exhaust gas measurement systems for use during engine development. Our SESAM measurement systems measure all important exhaust gas components in raw exhaust gas. One of our particular areas of focus here is the development of laughing gas measurement systems using quantum cascade lasers (QCL). These are relatively new systems, which we have launched on the market together with Fraunhofer IPM.

How did you come to work with Fraunhofer IPM?
Looking back, this marked the start of a successful journey for us. We had already worked with Fraunhofer IPM on a few smaller projects looking at hydrogen sensors. Then, in mid-2010, we were looking for a suitable partner to help us with the highly precise detection of laughing gas using laser spectroscopy. We were won over by Fraunhofer IPM's expertise in this new technology.

What expectations did you have at the start?
At the time, the technology we required was still very much in its infancy. We set ourselves the task of achieving a detection limit for laughing gas of less than 10 ppb with no cross sensitivity to other exhaust gas components. The first question we had to ask ourselves was whether this was even feasible. We wanted to find this out as quickly as possible, so the initial measurement system we developed was a simple, crudely designed tube with a laser and detector; each component was controlled separately and had its own display, power supply and lots of cables. Today's system looks very different, of course. It is not only fully integrated into its own industrial-grade housing, but also has its own integrated data interpretation and data interface. Nevertheless, on seeing how the very first design put together by Fraunhofer IPM immediately met our specifications, it quickly became clear to me that we were on to something special!

What have you come to appreciate the most about your working relationship with Fraunhofer IPM?
The specialist knowledge of Fraunhofer's staff. Their considerable expertise in laser spectroscopy has proved invaluable in helping us to develop a device that has never suffered from any serious teething problems. In fact, the measuring devices have lived up to our expectations from day one.

How important was Gaggenau's proximity to Freiburg?
The proximity proved very helpful whenever a prototype had to be delivered to us or we had to transport one of our systems to Freiburg. It also meant that we could try out ideas in the lab on the spur of the moment. It was extremely convenient that both sides were able to respond quickly and flexibly at all times. After all, when developing new products, the devil is always in the detail.

AVL EMISSION TEST SYSTEMS GMBH is a subsidiary of AVL List GmbH, the world's largest independent company for the development, simulation and testing of powertrain systems for passenger cars, commercial vehicles and large engines. AVL Emission Test Systems GmbH develops and manufactures gas analysis, measurement and automation systems for identifying engine and vehicle exhaust gases and evaporative emissions. The company has facilities in Neuss and Gaggenau in Germany, Graz in Austria and Plymouth in England. At the Gaggenau site, AVL Emission Test Systems GmbH employs around 110 people.

Has your work with Fraunhofer IPM helped AVL ETS to tap new markets?
It was actually lawmakers who created a new potential market for us by regulating laughing gas emissions. However, we hadn't developed any satisfactory solutions in this area and the competition was a step ahead of us. By joining forces with Fraunhofer IPM, we were quickly able to bridge this gap in our portfolio. It was important to us to stay up to date with all the necessary know-how ourselves, so that we could respond promptly to our clients' requests. And that is exactly what we have achieved.

What does the future hold for your industry?
There is a strong market trend towards mobile devices. Our clients are demanding smaller and smaller devices that minimize energy consumption and, wherever possible, operate without the need for calibration. The key concept here is »real drive emission«. We're also seeing this trend towards miniaturization in the area of stationary test benches. Clients are looking for compact solutions here too. This means we have to achieve the same levels of performance, e.g. in terms of response times, with less sample gas.

Test benches for use during engine development provide important insights that help make combustion engines even more efficient.

When does working with an external research partner prove worthwhile?
It's always worthwhile when you're looking to launch a new technology on to the market relatively quickly. If we'd worked alone, we would have needed to do a lot of preparation work to get up to speed with everything. This would have taken us years. Joining forces with a research partner allowed us to pool knowledge and resources. For example, our areas of expertise in measurement techniques, batch production, electronics and software development complement each other perfectly. Our cooperation also generated a number of patents for devices, which are now employed in measuring systems all over the world. We also always engage in very open discussions with each other. Even our managers meet annually to talk over new technologies and ideas as well as to consider future opportunities. Over the years this has resulted in a fruitful partnership based on a strong foundation of trust.

Thank you very much for talking to us!

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