

# Team with an Entrepreneur Gene

The development of innovative processes, such as BAYQIK, is one thing, but marketing this development can be quite another. The key is to think and act with an entrepreneurial approach – just like the sulfuric acid team at Bayer Technology Services.



**O**nce Bernd Erkes starts telling his story, there is no stopping him. His enthusiasm is reflected in his voice and his smile, and his blue eyes sparkle. Erkes is someone you enjoy listening to because with every gesture he emphasizes how thrilled he is about his job. “But the best thing is when we succeed in inspiring our customers’ enthusiasm as well,” he says.

And this is the very thing he manages to do with great regularity because he embodies the character of both the inventor and the salesman. “But somewhere I also seem to have an entrepreneur gene, which, to be honest, is very useful.”

Erkes is quite sure where it comes from. He was brought up in a family of craftsmen. His father, a self-employed carpenter, included the entire family in all of his business decisions. Whether it was a matter of investments or partici-

pating in a trade fair, whether contacting suppliers or approaching customers – “by the age of 14 it was already clear to me how much responsibility always comes with making decisions.” And Bernd Erkes was also very quick to discover what really mattered: “Making business with good ideas.”

**However, he also learned that while you can manage** small tasks on your own, you need a first-class team to handle the big challenges. “And that is what we have here,” he is visibly pleased to say. Each colleague on his team is an outstanding professional, whose individual capabilities cannot be praised enough. The team consists of Martin Kürten, the expert in sulfuric acid technology, Torsten Weber, the project manager responsible for product development, and Klaus Stemmer, responsible for marketing and sales. In addition to several



There would be no sulfuric acid without sulfur (left). To protect our forests, however, one must ensure that as little as possible sulfur dioxide is emitted into the atmosphere during conversion.

**“Effectively, what we have done is to significantly expand the operating range of commercially available catalysts.”** Martin Kürten, Bayer Technology Services

## In the days of acid rain

For many decades, sulfuric acid (SO<sub>2</sub>) contributed to air pollution – and was a major factor in producing acid rain, which lowers the pH value of the soil. This in turn is damaging for many trees. Particularly in the 1980s the



Acid rain is no laughing matter. For years it caused serious damage to trees and forests.

two terms acid rain and waldsterben, i.e. the death of forests, were closely linked. Since then, SO<sub>2</sub> concentrations in the air have been continuously and appreciably reduced. For instance, the values in Germany today are only one tenth of the concentrations of 30 years ago – and in some cases even lower. Among other things, flue-gas desulfurization in coal-fired power stations and the desulfurization of fuels have contributed to this reduction.

BAYQIK also helps to further stem emissions. While conventional processes for the production of sulfuric acid can only make use of the intermediate product SO<sub>2</sub> in a very narrow range of concentrations, BAYQIK makes it possible to utilize high SO<sub>2</sub> concentrations for the synthesis as well.

Sulfuric acid is one of the most important basic chemicals. For example, it serves in the production of fertilizers and is used for metal extraction, processing and recycling. Sulfuric acid is also an important component of classical car batteries.

others, each of these individuals contributed enormously to the success of the product. The product in question is no less than a complete sulfuric acid plant.

The first time this kind of plant was supposed to be sold, the team ended up having a real problem on their hands. Shortly before the end of the weeklong negotiation period, the negotiating partner discovered that the allotted time would not suffice to conclusively discuss all their open questions. After all, they were going to be the first company to acquire a process for which there were no other reference plants as yet.

The edginess was definitely mutual. Bayer Technology Services had financed the process development – with no guarantee that they would eventually secure the business. As the company was committed to supplier contracts for a limited period of time, on the last day of negotiations it was decided heavy-heartedly to give the customer the choice: either an agreement is reached today or negotiations will have reopen from the beginning. Shortly after midnight everything was resolved, and the team had the commission for a new sulfuric acid plant all sewn up. With this new plant, the company Berzelius Stolberg intended to increase production capacity by at least 30 percent. Both companies pledged to work in close cooperation and agreed that each respective partner would assume responsibility for certain risks.

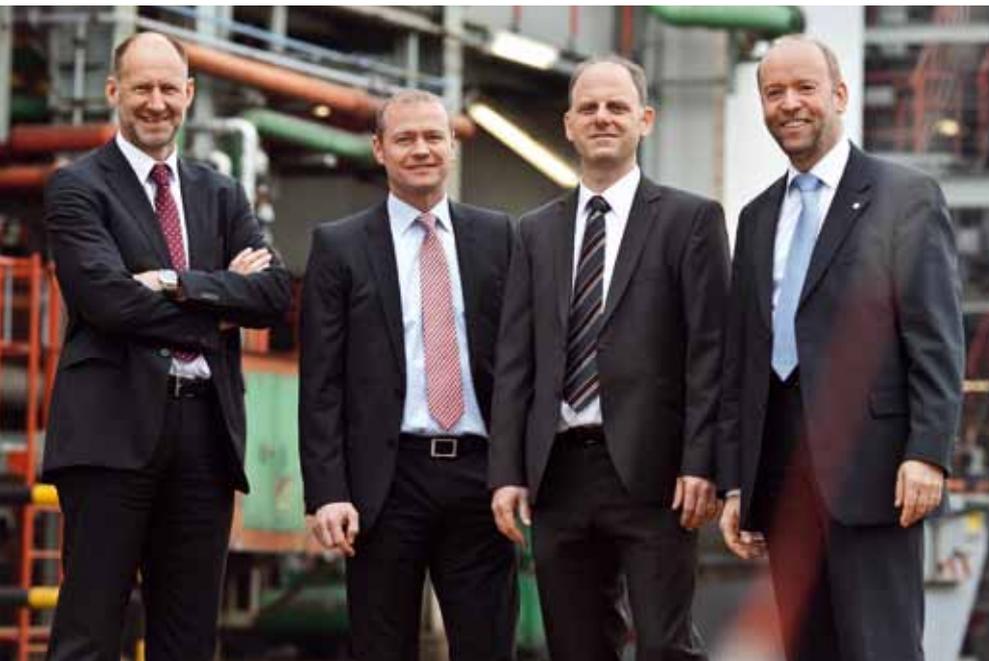
**The process is to be marketed under the name BAYQIK.** As co-inventor Kürten says, “It is an obvious choice” because speed is an important aspect of this innovation. Kürten likes to compare its effect to that of autocatalyst, which ensures that the process that takes many years in nature occurs immediately: the conversion of nitrous oxides to nitrogen and oxygen.

It is similar in the production of sulfuric acid. Under normal conditions, the chemical process progresses only very slowly. Conversion of sulfur dioxide and oxygen to sulfur trioxide, from which sulfuric acid is produced, can take weeks or even months. The innovation is that the process can be considerably accelerated with the help of BAYQIK – with a “sufficiently high conversion volume,” as Kürten stresses. A major advantage is that there are no longer any restrictions on the level of sulfur dioxide (SO<sub>2</sub>) inlet concentrations for the catalyst, which leads to a substantial reduction in sulfur dioxide emissions. And the existing plant capacity is increased by at least 30 percent.

Experts refer to this process as quasi-isothermal catalysis, and the respective first letters of the German version of this term are used to form the product name BAYQIK. The process has been known for a long time, but the conventional

## “We chose BAYQIK technology for several reasons: its robustness, process reliability and cost benefits.”

Dr. Urban Meurer, Berzelius Stolberg GmbH



There is a team behind every success. In the case of the new technology for the production of sulfuric acid, BAYQIK, the core team was a quartet (from left to right): Klaus Stemmer, Torsten Weber, Martin Kürten and Bernd Erkes.

approach only can be used with sulfur dioxide at a maximum concentration of 13.5 volume percent. Higher concentrations would irreversibly destroy the catalyst used.

However, higher concentrations are now possible thanks to the new process. The heat produced during the process is discharged so that the catalyst can be used at much higher SO<sub>2</sub> concentrations – without reaching or even surpassing its temperature limits. “Effectively, what we have done is to significantly expand the operating range of this commercially available catalyst,” as Kürten explains innovation.

**The entire metallurgical industry worldwide** stands to benefit from BAYQIK. It makes no difference whether the companies produce copper, nickel, lead or zinc – they all need sulfuric acid technology to treat their off-gas streams.

This is also the case with Berzelius Stolberg GmbH, the biggest lead manufacturer in Europe. The first industrial-scale plant based on the new technology in the world was built in Stolberg, near Aachen. “We chose the BAYQIK technology for several reasons,” says Managing Director Dr. Urban Meurer, when explaining the company’s decision. “Robustness, process reliability and cost benefits” all clearly played a role. Everything Bayer promised turned out “to

be completely true” he confirms. In some respects the goals were even surpassed.

Converting an entire production plant would normally involve lengthy downtime – resulting in enormous costs. As a consequence, these so-called refitting times are feared by every production plant. That is why Berzelius was even more pleased when they discovered that the planned, and already very short refitting time of a week man could even be under-shot, says Meurer. Today, he has plenty to say about the advantages of the new plant, and he has many opportunities to do so because the experts at Bayer Technology Services are always showing potentially interested parties the reference plant for the BAYQIK process in Stolberg. “And it is naturally particularly pleasing when the obvi-

ously satisfied Managing Director describes that the plant has operated from the first day exactly as it was planned,” says Torsten Weber.

Bayer Technology Services provided for virtually everything at the Stolberg reference plant: engineering, equipment, construction, procurement. Nothing was left to others. “From the beginning, we wanted to be sure that the plant would run exactly as we had planned,” Weber explains. “And if you want to design everything, you must also take on the full responsibility and do a lot more.”

After this experience the experts have long set their sights on the next goals. For instance, they have audited prospective customers for a similar plant in China, and the process is already under patent protection in the United States. Erkes also sees “great potential” in North and South America. The team has more ambitions for further technological developments. For example, a better catalyst may open new possibilities. In addition, one can imagine that the two-step sulfuric acid catalyst can be consolidated in a single step, which would further increase the energy efficiency. “This work will still take a number of years,” Erkes estimates. “But we all are itching to get started!”