

Germany

Eirich: Preparation Technology for Ceramics for Over 100 Years

For many decades now, Maschinenfabrik Gustav Eirich GmbH & Co KG (Eirich) has been the leading supplier of cutting-edge technologies for the preparation of raw materials and clay bodies in the ceramic industry as well as in many other industrial segments that work with bulk solids and powder-based starting materials. Many further developments in heavy clay ceramics, technical ceramics and refractories have only been made possible in the first place thanks to Eirich's innovative solutions for the basic operations of mixing and fine grinding. In the meantime, the company has also become established in the segment for Li-ion battery technology.

Stephan Eirich (SE), Managing Partner at Maschinenfabrik Gustav Eirich GmbH & Co KG (Fig. 1), gave us an insight into these developments during UNITECR 2023, the Unified International Technical Conference on Refractories, in Frankfurt.



Fig. 1 Stephan Eirich

rwf: COVID and the war in Ukraine have influenced the global market in a way that had not been the case in the years previously. What is your assessment in respect of the changes in the big market regions. What impact does this change have on the Eirich Group's international network (Fig. 2)?

SE: We are in the fortunate situation that my father Paul Eirich, together with his brother Walter Eirich, have created a basis that is well equipped to cope with such difficult market requirements. Their goal was always to establish regional, independent Eirich companies that adapt our core know-how to meet regional market demands. This was achieved with application-oriented

developments with locally based experts. In the years 2023/2024, we are celebrating some big anniversaries: 160 years of Eirich in Germany (Fig. 3), 50 years of Eirich in Brazil and Japan, 30 years of Eirich in China and 25 years in India. In Pune/IN, a new production facility has just been completed in 2023 (Fig. 4) – but we have been represented with a branch in India since 1999. These production sites in different locations can support each other as needed. Regionally there have always been new applications for Eirich intensive mixers. These initially only regionally significant insights, however, have also given us important experience for later work in other market regions. So, we can be very grateful to the preceding generation for a solid and stable international network, from which

our customers still profit today. With the beginning of COVID, we very quickly saw in China where it would become critical for our processes and made preparations for this in other regions – e.g. for the sudden increased demand for home officing and highly flexible working models.

Russia's aggression towards Ukraine, on the other hand, has another dimension. We had sales and service branches in both countries, and our sales in these two markets were significant. We very quickly closed our Russian branch and immediately ceased trading with Russia. This will have lasting repercussions for Eirich that we shall have to contend with long-term as, in the meantime, Chinese suppliers have taken over our role in serving all our long-standing, good customers.



Fig. 2 Eirich locations worldwide



Fig. 3 Founder house in Hardheim/DE

rwf: *Ceramics has always been an important area of work for Eirich. What trends do you see here?*

SE: Refractories have been one of our key areas for a good 100 years. That is why at UNITECR 2023, we have presented, now for the 13th time, the Gustav Eirich Award, which is named after our company founder and has, over the course of the years, recognized no fewer than 40 outstanding young people for their innovative work in this field (Fig. 5).

Of course, besides refractories, other work from silicate and technical ceramics has been added. Overall, a trend can be observed towards finer mixes and, especially in technical ceramics, low-contamination processes. Recycling is gaining importance in all segments. Flexible production processes often require smaller and more variable batch sizes. But we can easily cater for that with our system solutions, also in respect of the energy and material efficiency required. With its wide spread over different branches, Eirich can supply novel process combinations. Our machines have evolved from straight mixers to "all-in-one reactors" that can work with changing temperatures and pressures.

rwf: *You supply particularly processing machines and systems that are individually tailored to specific applications. Do any fundamentally new applications still come up today?*

SE: Of course, one big area, driven especially by electromobility, are batteries. We have been active in R&D for Li-ion batteries for almost 15 years, and over the last few years the first major projects for gigafactories have been realised.

A special constellation is that the state-of-the-art technology currently comes from Asia and is certified on the basis of the machine technology that is standard there. Consequently, it used to be pointless us offering better and more efficient mixers because extensive and demanding new certification by the user branches presented a first big hurdle, taking up a great deal of time. That has changed in that now the production facilities for batteries are coming to Europe. However, here, we have had to deal with initial-



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Fig. 4 Production in Pune/IN

ly new partners for us from the automotive sector and have had to learn to get closer to their requirements and expectations. But we are making progress here, too and carving out a completely new and promising field of application for our products. The increased hygiene requirements resulting from this application for our new machines are allowing us to approach other segments such as food-stuffs, cosmetics or pharmaceuticals. There have been many such success stories in our 160-year company history. Besides complex and costly research and development work, you need first and foremost staying power. Our test centre in Hardheim and at the other locations play a key part here. In the meantime, we have even become involved in new battery projects in Asia. In South Korea and Taiwan, other gigafactories are currently being set up with our technology for slurry production. We are also following other topics from the fields

of new energies, like alternative battery systems, fuel cells or electrolyzers, and we are already directly or indirectly involved in their development.

rwf: *How do you see digitalization?*

SE: We were addressing digitalization long before it became trendy. So we can already reference established developments like continuous condition monitoring and global remote service options for optimising our customers' machine availability. Moreover, for decades now, we have been operating inline process and quality monitoring with sensors or independent fully automatic measurement devices that are used for autonomous control of a wide range of process parameters. Communication with upstream or downstream process steps also serves our machine systems for material optimization for, for example, scheduled model changes in mould production. In this field, we are going with au-

tonomous analysis tools, AI-based process assistance, and mostly recently product characterisation with deep learning. The data obtained with these methods serve as a basis for intelligent regulation processes that can optimise themselves. New correlations in process and quality optimization in complex systems can be identified in this way and used to regulate production lines. This also has other interesting aspects. The working world is changing. The number of employees available with decades of experience is on the decline. The younger generation has other ideas when it comes to approaching problem solutions. In this context, increasing digitalization with its self-optimising processes is very well placed.

Under all these auspices, we set a new milestone for our group of companies last year: a joint venture with the name "Pro-sio Vision" offers intelligent analysis and control systems for the bulk solids industry and is being successively built up into the AI centre in the Eirich Group.

rwf: *Besides many trade fairs, with ceramitec 2024 and AICHEMA 2024, two key dates are coming up. What will be Eirich's focuses there?*

SE: The focus at ceramitec will be sustainable solutions for more resource efficiency and energy saving. We want to show our customers how we can help them to optimise their processes with smart digitalization and efficient machine technology. Naturally, we shall also address the trends in the ceramics industry we touched on earlier and present our latest high-tech features for our flexible one-pot process machines.

We want to use the opportunity at AICHEMA to demonstrate our efficiency and our solutions in the field of contamination-sensitive preparation technology. Our portfolio of machines in stainless steel design offers great potential for a wide range of sophisticated applications in process engineering. Here, too, efficiency and sustainability are important catchwords for which we will have solutions ready to go.

We shall also be bringing our latest generation of laboratory mixers and some new features with us at all key trade fairs. Our customers expect innovative problem solutions from us and we won't be disappointing the trade visitors in that respect.

rwf: *Thank you for talking to us.* KS



Fig. 5 Eirich Award Ceremony at UNITECR 2023 (f. l. t. r.): Christian Dannert (ECREF/DE), Maciek Ludwig (Arcelor Mittal Refractories/PL), Stephan Eirich, Audrey Tixier (CEMHTI-CNRS/FR), and Dominik Hahn (Calderys/DE) (Source: Jenny Wolf)