

GERMANY

# KRAHN Ceramics: Technology Partner on a Broad Footing

Project partner and accelerator for everything concerning the processing of ceramic powders, this is how KRAHN Ceramics GmbH has positioned itself. The company headquartered in Hamburg operates not only as a supplier and producer of powders, binders, process additives and custom-made feedstocks for ceramic injection moulding, it also offers its customers consulting and product development along the ceramic process chain. KRAHN Ceramics can draw on more than 30 years of experience in the market: As part of a strategic reorientation, the technical ceramics division of KRAHN Chemie GmbH 2020 was spun off together with the binder business acquired from eMBe in 2019 into a separate company – KRAHN Ceramics was born. We spoke to Dr Stefan Stolz (StS), Managing Director of KRAHN Ceramics, about project partnerships, the role of a creative laboratory and plans for the forthcoming years.



Fig. 1  
Dr Stefan Stolz, Managing Director  
KRAHN Ceramics GmbH

**CA:** Since 2020, KRAHN Ceramics GmbH has been operating as an independent company. What has the establishment of this division accelerated? How do you stand out from your competitors?

**StS:** As a distributor, KRAHN has been operating in ceramics for more than 30 years. I, myself, after receiving my doctorate at the Friedrich Alexander University of Erlangen under Prof. Greil and later gaining first industrial experience at CeramTec, I have joined “Team Ceramic” in the Krahn Group in 2008. The business model that has now been established has been steadily matured in recent years because we

haven't just partnered our customers as a distributor, but have always provided them with very technology-oriented advice. In the marketplace, we stand out very clearly thank to our broad approach: We support our customers as a technology partner with our own portfolio of products and services along the entire value creation chain. We have

continuously widened our product range for ceramics in recent years and now, besides the ceramic powders from renowned producers, we offer a solid portfolio of our own in-house products, consisting of selected process additives, an extensive array of binders for ceramic injection moulding and a range of ceramic injection moulding feedstocks modified to cater for specific customer requirements. Moreover, we advise and support customers in the development of individually tailored technical solutions along the entire ceramic process chain. In contrast, our competitors are generally specialists in one of the value creation steps.

As part of the Otto Krahn Group, we can also draw on the international network of a family-owned company with a long-term strategy: Worldwide, the group is represented at 39 locations, with around 1600 employees, its turnover totalled around EUR 1,5 billion in 2021. And we have a lot of technology expertise in polymer chemistry, compounds and injection moulding in-house.

As a young division in an internationally established group, naturally, we have the advantage of being able to use its international network and thus to have a strong partner in the background when investments are needed.

**CA:** What are the most important business segments of KRAHN Ceramics today and what news is there on this front?



Fig. 2  
Process additives

**StS:** Over the years, we have successfully developed the ceramic powder business into a mainstay. Here, for standard ceramic materials, we offer suitable raw materials. Besides straight raw materials, we also focus on ready-to-press products, that is prepared granulates that customers can process immediately. Here we can build on years of trust-based cooperation with our international production partners. For alumina powders, for example, we cover a range from 96 to 99,99 % purity.

For decades now, our innovative partner and world market leader in zirconia powders for high-performance ceramics has been Tosoh Corporation, headquartered in Tokyo. Our close cooperation enables us to respond to market needs and to continuously supply our customers with innovative products. Latest example is the new development Zgaia™: With a very high fracture toughness of  $10 \text{ MPa}\cdot\text{m}^{1/2}$  in combination with high strength reaching 1200 MPa, obtained at low sintering temperatures of 1250 °C, the powder is optimally suited for making components for heavy-duty applications.

Against the background of increasingly complex customer requirements and the long-term availability of raw materials, we are also developing our own production of binders and process additives with new products, which are then used, for example, as the basis for our own ready-to-use products like, for example, customised feedstocks. For instance, the kcmix® product line now includes dispersants, defoamers, binders, surface-active substances, softeners and rheology additives. Examples of such new developments are kcmix®1.CE64 and kcmix®3.K85. In response to numerous customer enquiries, we have decided to invest short-term in developing and increasing capacities for process additives. The result is kcmix®1.CE64, which today we can supply to our customers as a universal dispersant additive for aqueous systems with very short lead times and in sufficient quantities. For aqueous debinding of CIM injection moulding compounds, the established Embemould® series of binders has been further developed: kcmix®3.K8X. The CIM compounds produced with these systems impress with their improved performance. The binder systems can

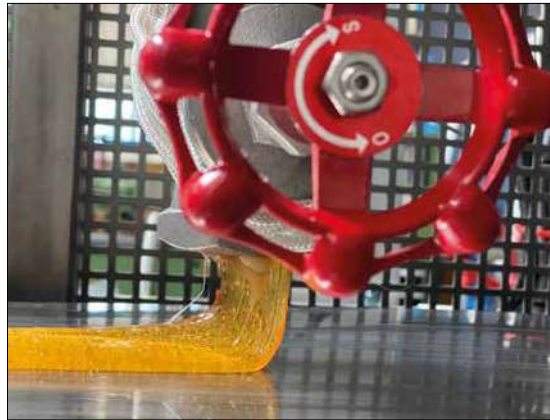


Fig. 3  
Binder system

be used universally, but were designed specifically for the realisation of complex component geometries.

This year, KRAHN Ceramics is concentrating on setting up additional capacities for kcmold® CIM feedstocks at its Hamburg site. Parallel to this, we can rely on our technical centre in Dinslaken to cover current production requirements and all new feedstock developments.

**CA:** What possibilities does the technical centre in Dinslaken offer specifically?

**StS:** We should like to invite our customers to use the KRAHN Ceramics technical centre to further develop their products with us. This includes powders, binders and process additives, preparation and shaping processes, debinding and sintering as well as surface finishing. With many of our customers, we already have joint projects up and running successfully in the technical centre: KRAHN Ceramics works as an extended workbench and creative laboratory for trying out new things.

For developments of new binder systems for powder injection moulding, but also for 3D printing (ceramic filaments and granulates), since 2021 a pilot-scale binder line has been available in the technical centre. The range comprises binder systems, that can be debinded aqueously, with solvents, catalytically or purely thermally.



Fig. 4  
CIM-Process



Fig. 5  
CIM-Feedstock



Fig. 6  
Feedstock used in a component

For production of ceramic injection moulding compounds, there are already two compound lines on the basis of proven shear roller technology. Here CIM feedstocks are individually developed and produced for customers.

The test centre gives KRAHN Ceramics the possibility to develop new products very quickly and then to upscale these into production. We did this very successfully, for example, for process additives last year.

**CA:** How do you make sure that the customers' know-how does not find its way into the market?

**StS:** We work long-term with our customers on the basis of trust, individual confidentiality agreements go without saying. And, of course, the customers decide at which point and in how much detail they want to tell us about their projects.

**CA:** Where are you presenting the KRAHN Ceramics portfolio?

**StS:** Being present at the key trade fairs and congresses is a must: in June 2022, KRAHN Ceramics will debut at ceramitec in Munich, the leading international trade fair for the ceramics industry. Here, we shall give very practical insights in to our understanding of product partnership, e.g. concerning customised compounds. For October this year, the World PM2022 in Lyon and K 2022 in Düsseldorf are also noted in our diary. In the plastics field, too, we want to actively promote the use of ceramics. On LinkedIn, we shall publish a series of information articles on this subject.

**CA:** What are your plans for the next few years?

**StS:** KRAHN Ceramics is working together with customers on making the ceramics market grow overall. Another goal is to generate new customers who have not yet got

involved with ceramics. The plastics business in the Otto Krahn Group, for instance, offers great potential for opening up new applications.

Of course, it is not about replacing applications in the plastics business, but generating on-top projects, giving customers in the plastics business options to open up new markets. Today, ceramics can be used in numerous sectors – we want to show potential customers this wide range of opportunities and how to utilise these. Here an example from design: in high-end, luxury watches, a large number of watch cases and link chains are now designed as ceramic elements. Going on from this, there is great potential for other applications for exquisite, aesthetic products.

The installation of the state-of-the-art production line for CIM feedstock this year is also aimed at widening the distribution of injection moulding technology for ceramics and opening up new applications for ceramics. The installation of further capacities is planned.

A next important goal for KRAHN Ceramics is extending the network of selected technology partners. We are always on the lookout for companies with which we can cooperate. For partners that can join us in working intensively on projects, from samples, through test runs and corresponding modifications, in line with the requirements of customer applications, for example for a "tailormade feedstock", so that it fits perfectly to a particular application. Using our injection moulding systems, we can perform such tests ourselves and optimize the material at the same time – fully in line with customer requirements.

**CA:** Thank you for talking to us.

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