In conversation with Markus Mauch, Global Director Sales Mechanical Engineering/Aviation, ElringKlinger Kunststofftechnik GmbH

Tailor-Made: Seals to Meet Every Requirement

Whether PTFE seals, friction bearings, semi-finished products, complex assemblies, PTFE compounds, MoldflonTM PTFE, or other high-performance plastics, ElringKlinger Engineered Plastics combines state-of-the-art manufacturing technology with decades of experience. Markus Mauch, Global Director Sales for Mechanical Engineering/Aviation, tells KEM Konstruktion how, by supporting its customers from the development phase onward, the specialist company is able to find optimal solutions even for complex requirements.

Interview: Dr.-Ing. Ralf Beck, Redakteur KEM Konstruktion

ElRoSeal™ – Rotary Shaft Seal for reduced friction and improved efficiency

Bild: ElringKlinger Kunststofftechnik

KEM Konstruktion: You see yourselves as technology partners and talk about your application and processing expertise. How does this benefit your customers?

Markus Mauch: That's right. We see ourselves as technology partners and strive to build a development partnership with our customers as part of a long-term relationship. In an ideal scenario, their developers and designers come to us with their problems and questions relatively early on in the development phase. We use our many years of experience to try to find the perfect solution for the user. We aim to meet all requirements as effectively as possible by means of in-house innovations in design and materials. The customer should get exactly what they want from us and what is the best technical and cost-efficient solution for their application. Another advantage of our technology partnership is that we bring together a wide range of manufacturing processes and possibilities under one roof.
From the production of individual parts through the mass manufacture of millions of units, we cover all processes in-house and can draw upon them as required. We also have manufacturing capabilities in Europe, Asia, and the USA – wherever our customers need our products.

KEM Konstruktion: Could you give us an example of the benefits for users?

Mauch: We usually start by visiting the customer's site to discuss current projects. The user approaches us with thoughts, ideas, or preliminary developments. We then use this information to realize the ideal solution – whether it be bellows, a rotary shaft seal, or a customer-specific design. We do not offer many standard components that we can simply pull out of a drawer. The majority of our products are based on customized developments that we can turn to at any time, or on our ability to adapt existing solutions.

KEM Konstruktion: What role is played by developing your own materials? Can most sealing tasks be handled using standard materials, or are materials developed to meet specific requirements the better choice?

Mauch: ElringKlinger Kunststofftechnik GmbH originally came to prominence thanks to its polytetrafluoroethylene (PTFE) materials. Since then, we've expanded our focus to cover all high-performance plastics, such as polyether ether ketone (PEEK) and perfluoroalkoxy alkanes (PFA). We do our own development work in-house. Of course, we have certain standard materials that are immediately availa-

Bild: ElringKlinger Kunststofftechnik

"Our main focus for the future is the subject of assemblies."

Markus Mauch, Global Director Sales for Mechanical Engineering/Aviation, ElringKlingerKunststofftechnik GmbH

ble, and we use them whenever appropriate. But if there's a significant difference in requirements—a particular technical specification perhaps, or when a customer wants a special color—we develop custom materials.

KEM Konstruktion: Can you give a rough estimate of how often you use standard materials for sealing tasks and how often you use materials developed for specific applications?

Mauch: We can either draw upon several thousand different materials that are already available or develop new ones. I'd estimate that existing standard materials can be used for around 90 percent of applications.

KEM Konstruktion: ElringKlinger has also developed a patented concept for rotary shaft seals in turbo applications. Could you explain the technology behind Speedflon™?

Mauch: The Speedflon™ seal was developed in ElringKlinger Engineered Plastics' automotive department and is used in turbochargers and e-boosters. These technologies involve rotating shafts that turn rapidly. In a further development for mechanical engineering, we now offer a rotary shaft seal from the ElRoSeal™ product line. We can also use this technology in this area of application to provide a reliable seal at very high speeds and increased pressures. Friction is the defining issue when it comes to rotary shaft seals. Reduced friction means less heat, increased efficiency of the application, and minimal wear on the seal. With the help of certain concepts, we're able to adjust friction levels to suit particular requirements. This has been proven in numerous tests. Springs are used in a variety of ways to specifically minimize the friction on a seal so that substantially less heat is generated and the service life significantly extended.

KEM Konstruktion: What is the principle behind your memory packing technology, and what is it used for?

Mauch: Memory packing is a product we developed that exploits the inherent memory effect of polytetrafluoroethylene. In the manufacturing process, the product is deformed in such a way that, when it is in use, it tries to return to its original state and thereby produces a certain degree of preloading, which creates a sealing effect. These seals are often used in single-sided low-pressure applications, such as pneumatic systems. In some cases, very high quantities are produced, also with the help of automated production lines.

KEM Konstruktion: Do you also make seals from Moldflon™ thermoplastic materials?

Mauch: Moldflon™ is our patented material, which is manufactured almost exclusively in an injection molding process. The injection molded thermoplastics material group is also used for seals and is a particularly attractive technology when very high quantities or very complicated shapes are required. In these cases, machining processes would be too expensive or impossible. The seals can be manufactured in large quantities using the mold and therefore at a very reasonable cost. An example of one of our products is a spring-energized seal, which is produced using the Moldflon™ injection molding process.

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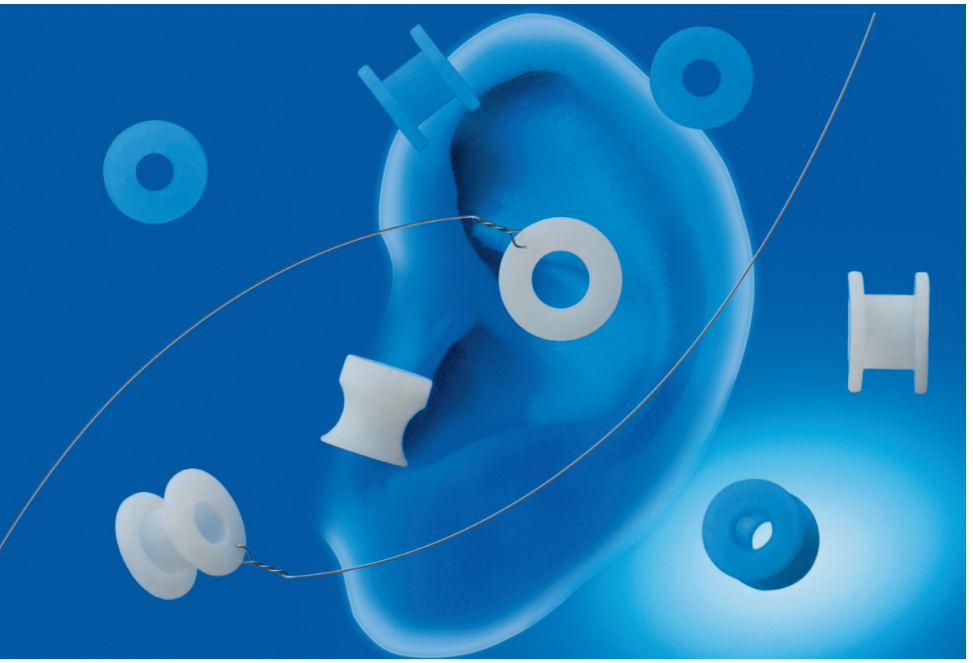
KEM Konstruktion: Do you also supply micro seals?

Mauch: Miniature seals and miniature products are a new area for us. We can produce parts under 5 mm in size by applying machining techniques in either the turning or the milling process. This way, we're more than capable of manufacturing products in the tenth of a millimeter range with various geometries as well as form and position tolerances. Almost all the materials that we produce in-house as semifinished pro-



Small implants for use in ENT medicine

ducts are processed in this way. Our micro components are used wherever necessary on account of small available installation spaces. I'm thinking in particular of the sensor sector or medical technology, with products manufactured to dimensions of under 1 mm. We've established a very stable production process. To guarantee quality levels and ensure products conform to their designs, the process includes monitoring using microscopic measuring devices. Nevertheless, measuring technology has its limits when the parts become so small that it's very difficult to measure them and check their quality.

KEM Konstruktion: What's currently in the pipeline in terms of sealing products?

Mauch: Because we're constantly developing and improving our existing product lines, we're always releasing new versions or designs of existing standard seals or sealing principles. In the future, assemblies will be an area of focus.
As I mentioned earlier with respect to our injection molded Moldflon™ material, we're also able to work with plastics other than high-performance plastics. For instance, we can overmold a PTFE sealing lip to reduce the number and variety of components used by the customer. Existing sealing principles like rotary shaft seals are overmolded and then manufactured by us in the form of a housing that is adapted to meet the user's specific requirements—a lid, for example. Another area of focus for the future is the subject of sensors—we think there are a lot of ways for us to contribute our manufacturing and materials expertise here. This could involve protecting sensors used in harsh, aggressive environments—in terms of temperatures and media, for example. I'm thinking in particular of the use of welding technology: sensors or sensor chains that can be welded tightly together and are thus reliably protected from any influences bearing on the application. This way, the service life of the sensors won't be impaired by the environmental conditions. Other important concepts in this context are hygienic design and miniaturization. We plan to steadily develop our manufacturing processes and capabilities in these areas too. In addition, we have the option of manufacturing in our Class 8 in-house clean room. This gives us the opportunity to expand our product range—especially into the medical sector. For example, I have in mind hoses with special markings that we can incorporate into the material so they can't be washed off.

KEM Konstruktion: Since we're on the subject of medical technology, can you give us an example of a seal for a product in this field?

Mauch: In HPLC (high-performance liquid chromatography) technology, for example, a conventional seal is used to contain high pressures. There are also tiny implants used in ENT medicine, such as tympanostomy tubes. One of these can be inserted into the ear canal when there's a pressure imbalance. This is most definitely an application of seal technology in the medical sector. Another product group consists of endoscopy tubes. Our portfolio also includes many more components for medical equipment—that is to say, accessories. Products developed for devices of this kind in the field of medical technology are often highly customer specific.

KEM Konstruktion: What possible applications are there for your new ElRoSeal™ shaft seal?

Mauch: Our product—based on the automotive seal Speedflon™, which has now been further developed and optimized for mechanical engineering solutions—is also in the ElRoSeal™ product line and stands out thanks to its variable friction behavior. It's ideal for use in all instances where increasing the efficiency of an application is a priority. I'm thinking here of electric motors in sectors like food and pharma, where we can see great potential for efficiency improvements.

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Detaillierte Informationen zu den Radialwellendichtringen für den Maschinenbau:
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