konstruktions praxis - spezial
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Available Know-how...

Use the extensive Know-How and synergy effects of a component supplier.

High-performance plastics, like PTFE, are increasingly being used in automotive components. Benefits, such as a wide temperature range from –260° to +280°C, very good tribological properties and universal resistance, offer design engineers an expanded range of possible solutions and protection from unpredictable interference factors.

PTFE and PTFE compounds are already being used at production level in a wide range of highly different automotive components. These include exhaust and emission control systems, fuel injection systems, temperature management and cooling systems, camshaft and crankshaft seals, compressors and condensers, braking systems, valve shaft seals, transmissions, powertrain systems and many others.

Detailed description of memory packing

Application-Specific Solutions
Most of the assembly components used are application-specific product solutions, which ElringKlinger Kunststofftechnik has jointly developed, sampled, tested and launched for production with its customers, based on specific requirements profiles. The physical properties of PTFE compounds may be influenced via organic and anorganic fillers. However, to optimize such properties as wear resistance, friction and cold flow behavior, the PTFE compounder must be able to draw on extensive experience, combined with the requisite technical equipment.

Example:
Memory packing
The following example serves to illustrate the vast array of possibilities to combine PTFE with a product: The decompression valve is located in the cylinder head of the engine and opens and closes the valves via the valve shafts to activate the engine brake. This is a typical application where the dry running properties and the wide temperature range from –40 to +140°C are some of several good reasons for using the high-performance plastic PTFE.
Another special aspect is the activation medium, which may either be compressed air for dry running conditions, or oil. This places special requirements on the design of the sealing rim, depending on the media used in the respective application.
The mating surface, in this case, is cast iron. ElringKlinger Kunststofftechnik solved the problem presented by this difficult combination of mating surfaces by selecting a suitable PTFE compound, a special mixture of organic and anorganic fillers.
Also, the PTFE compound must provide reliable assurance of lasting throughout the product life cycle involving 1 million load changes, which equals a driving distance of 10 million kilometers.

Demands like minimal and constant sliding or displacement force can be influenced primarily by the design of the memory packing geometry, added to which are the favorable tribological properties inherent in the PTFE compound. In addition, it is important to define the appropriate ratio between a “low coefficient of friction” and “initial sealing performance” and to support these parameters in field tests.

Conclusion
The use of PTFE as a compound offers the possibility of designing multi-functional elements, which can combine the functions of sealing and guiding with that of a housing in a single component. Alternative design concepts for this type of application would have been piston rings, spring-energized seals, jacket rings or piston plating.

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