December 04, 2019

KS Kolbenschmidt

New polymer-coated thrust washer KS R 535L1

Among the key technologies in the transition phase to electromobility are the gradual hybridization of the powertrain and the minimization of internal engine losses through the use of low-viscosity oils. Both also have an effect on the requirements placed on the radial and axial bearings within the engine. As an axial bearing solution, KS Gleitlager GmbH now offers its customers the new polymer-coated thrust washer KS R535L1 with high resistance to wear caused by start/stop modes of operation and excellent mixed friction stability.

One way of reducing the fuel consumption and emissions of combustion engines is to increase the efficiency of the internal combustion engine by using low-viscosity engine oils. While viscosities of 0W30 and 0W20 are currently used for modern engines, oils with significantly lower viscosity classes are already being tested in the development and pre-development departments. However, it becomes evident that the proportion of mixed friction at the engine plain bearings increases disproportionately. The thrust washer KS R535L1 and, in particular its polymer coating, help to compensate for these mixed-friction drawbacks.

As a bridge technology on the way to electromobility, partially electrified and thus hybridized vehicles will significantly increase their market share in the coming years. Depending on the region, vehicle segment and customer requirements, micro, mild, full or plug-in hybrid powertrains will be used. The various hybridization stages are achieved by a modular system, analogous to the vehicle platforms. The essential modifications are made to the auxiliary units, for example a mild hybridization is usually achieved by the replacement of the alternator with a belt-starter generator. The basic engine and thus the installation space for the axial bearings of the crankshaft remain unchanged, which is why the engine manufacturers require a correspondingly new axial bearing solution that is suitable for these start/stop loads. Conventionally, the axial bearing of the crankshaft is designed as a loose thrust washer manufactured from a steel-aluminum-tin composite. With KS R21, KS Gleitlager offers an axial bearing solution that has proven itself millions of times over.

To cope with the increasing start/stop load in micro and mild hybrid engines, KS Gleitlager introduced four years ago the thrust washer KS R535, which uses a steel-aluminum composite containing silicon.

Rheinmetall Automotive AG
Corporate Communications · Karl-Schmidt-Strasse 2-8 · 74172 Neckarsulm, Germany · Phone +49 7132 33-3140 · Fax +49 7132 33-3150
www.rheinmetall-automotive.com

Polymer coating with high solid lubricant content

The new polymer-coated thrust washer KS R535L1, debuting at this year's IAA, is based on precisely this more wear-resistant composite, but is also provided with a polymer coating after part manufacture. The L1 coating consists of a polyamide solid lubricant composite applied by transfer pressure. Only the running surfaces are coated with the composite, colored gray-black as a result of the high solid lubricant content.

Wear reduction and mixed friction stability

Compared to the standard steel-aluminum composite thrust washers, the start-stop test with KS R535L1 shows a significant reduction in wear with an increasing number of start-stop cycles. In addition, the mixed friction test on the thrust washer test bench reveals the improved emergency running properties of the L1 polymer coating. The high solid lubricant content reduces friction, smoothes the torque curve and ultimately leads to a significantly longer emergency running time.

Engine testing in various hybrid drive trains with 48V belt-starter generator systems (RSG), integrated starter-generator systems (ISG) and low-viscosity engine oils also confirms the high wear resistance and robustness of the KS R535L1 thrust washers.

The polymer coating process was chosen so as to allow a high degree of freedom in the design of the thrust washer. KS R535L1 is available either as a loose thrust washer or as a mounted collar bearing. KS Gleitlager thus offers its customers for all stages of hybridization state-of-the-art axial bearing solutions which can be flexibly adapted to the available installation space within the engine and design requirements.

Rheinmetall Automotive AG
Corporate Communications · Karl-Schmidt-Strasse 2-8 · 74172 Neckarsulm, Germany · Phone +49 7132 33-3140 · Fax +49 7132 33-3150
www.rheinmetall-automotive.com