All in vane

Rotary actuators in vehicle anti-roll systems manufactured by ZF Sachs are fitted with advanced vane seals to minimize leakage

Trelleborg Sealing Solutions supplies advanced vane seals to a major automotive component manufacturer, ZF Sachs, for a rotary vane actuator used in their active roll stabilization system. The razor sharp edges of these stamped sintered plates ensure maximum sealing integrity between fluid chambers that control actuation.

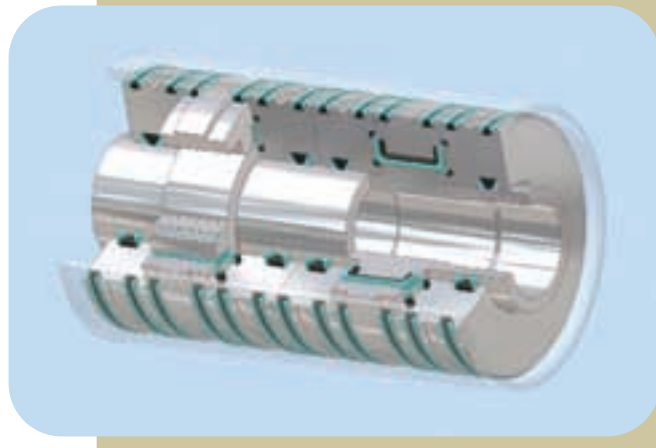
ZF Sachs, a major manufacturer of suspension systems, approached Trelleborg Sealing Solutions when they were developing their innovative active roll stabilization system. Movement was to be controlled by a rotary vane actuator, and they needed vane seals that could minimize leakage across compartments. However, they also wanted them in high volume and supplied as cost-effectively as possible.

Razor sharp vane seals proved in application

Effective sealing within rotary vane actuators is a challenge, as the shape to be sealed is rectangular and the four corners of the seals must be razor-sharp. If the seal is not perfect, liquid can leak from one working space to another, deteriorating performance of the suspension system.

The usual method of producing these rectangular seals is by milling, but this is costly and significant volumes can be difficult to achieve. So, engineers at Trelleborg Sealing Solutions decided to look for a different process to reduce production costs and increase yield. Their alternative was to stamp sintered plates of Turcon® PTFE based material to the shape of the seal. Now used for several years by ZF Sachs, sealing integrity is proven. They operate effectively at temperature extremes, ranging from - 40°C (-40°F) to well above +100°C (212°F), and at pressure exceeding 150 bar (2175 psi).

Innovative manufacturing of vane seals takes place at Trelleborg Sealing Solutions Helsingør. These products are now providing distinct cost and performance benefits to customers, extending the potential applications for rotary vane actuators in many different sectors of industry.



What are rotary vane actuators?

Rotary actuators are used to pivot a joint and are an alternative to conventional cylinder mounting. Unlike these, they are not limited to a 90-degree pivot but can achieve arc lengths of 180, 360, 720 degrees or more, depending on the configuration.

There are many types of rotary actuators but in a vane actuator, a rotor replaces the piston, which operates within linear hydraulic cylinders. This has one, two, three or more vanes attached to it. When differential fluid pressure is applied to the working chambers, the actuator turns.