

Herbert Hänchen

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Testing without leakage

A dynamically sealing synthetic ring with integrated retaining ring made from H-CFRP prevents excessive pressure build-up on the sealing surface due to hydraulic pressure

The Servoseal sealing element from Herbert Hänchen, a hydraulic test actuator manufacturer, reduces energy loss due to leakage and is wear resistant.

Conventional test actuators use hydrostatic bearings and pistons fitted without pressurized seals. In these so-called gap seals, sealing is achieved by a tight gap between the moveable parts. These designs are complex and the throttle gap causes a considerable reduction in hydraulic efficiency due to leakages. On the plus side, these seals operate practically frictionless, are suitable for maximum frequencies, accelerations, side loads and speeds up to 4m/s (9mph) in stick-slip-free operation, as standard.

In less demanding applications, it is possible to use contact sealing systems in which the hydraulic pressure presses the sealing rings onto the sliding surface. Such sealing elements give a very tight seal and operate efficiently. However, seal friction and wear increase at greater pressures. Stick-slip effects can also occur, thus hindering the smooth movement of the actuator. At low amplitudes, the lubricating film under the sealing edge might also tear off, leading to signs of wear both on the sealing surfaces and on the counterfaces of the actuator tube or piston rod. This effect occurs particularly prominently if the amplitude is smaller than the seal width.



More recently, high-performance carbon composites have been key to the creation of new solutions in the production of hydraulic actuators and other elements, marketed under the name H-CFRP. This expertise has now led to the development of a new sealing system that can be used in many applications, as it combines the advantages of gap seals and contact sealing systems. This is how the Servoseal sealing element came to be used as both a piston seal and a rod seal that is almost completely wear-free and at the same time exhibits no energy loss due to functional oil.

Servoseal is a dynamically sealing synthetic ring. The integrated retaining ring made of H-CFRP prevents excessive pressure build-up on the sealing surface due to hydraulic pressure. At low amplitudes, wear and scoring on the counterfaces due to lack of lubrication are eliminated. Thus, the new

Servoseal sealing element can be used in the sleek servo-actuator series 120 and 300, as well as in the testing actuator series 320.

This offers a cost-effective and extremely powerful alternative to known actuator brands. With these servo-actuators, users can realize testing tasks with low amplitudes and frequencies up to 25Hz, low side loads and high accelerations. Hänchen offers a wide range of actuator dimensions in this series. Bores of 40-140mm (1.6-5.5in) with 23-226kN and strokes up to 1,500mm (60in) are available. Servoseal can also be used in applications where the actuator performs pivoting movements.

In many cases, it is also possible to equip the customary hydrostatic testing actuators in the 320 series for highly dynamic movements and high side loads with the Servoseal, for example at the piston, and thus achieve better hydraulic efficiency. Hänchen offers actuators with hydrostatic bearings from 4-600kN at 210 bar. The bore can be freely defined for rods with a diameter of 25-60mm (1-2.4in). This enables the test actuator to be designed to the exact requirements. Additionally, often a smaller control valve may be used, since there is no functional oil flow and no leakage of the gap seal with the use of the Servoseal. This saves costs and, depending on the application, also increases the achievable dynamics. ◀

ABOVE: The Servoseal 320 series (LEFT) and 300 series (RIGHT) offer a more affordable solution to known actuator brands – for example, the MTS series 244

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