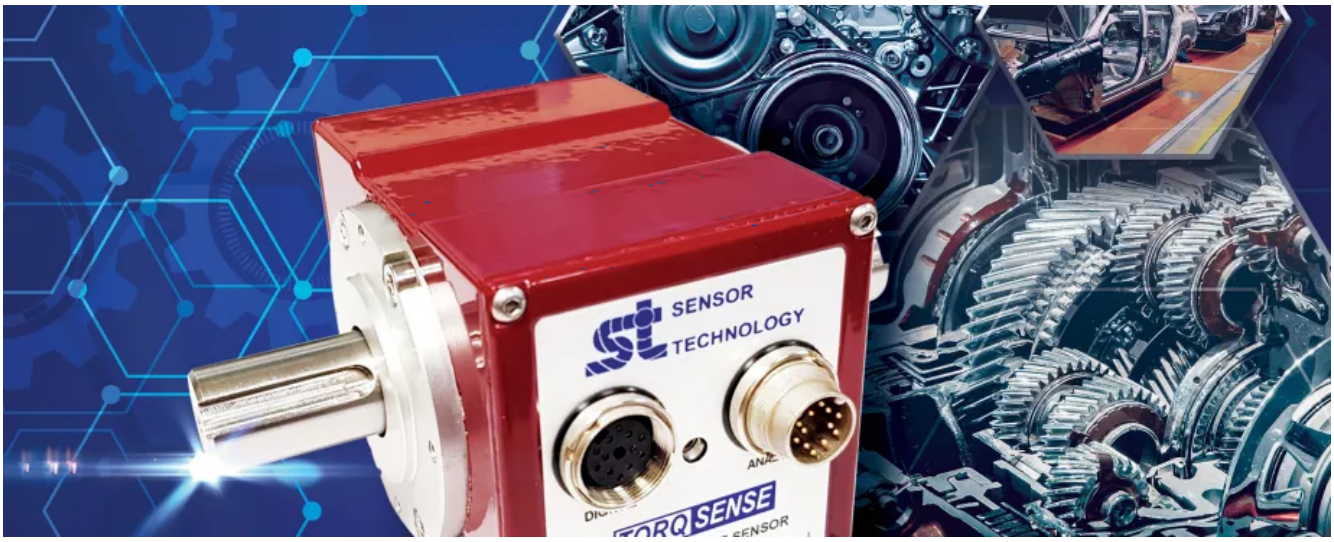

Product News

World's best Vacuum Seals tested but not Touched

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Wroxton, United Kingdom –

TorqSense, a non-contact digital torque monitoring system that could guarantee an infinite lightness of touch has proven to be the only way to test the seals of super high performance vacuum systems.

The ultimate fields of precision manufacture, such as electronics, biophysics and thin film deposition where tolerances are measured in atoms, are often conducted in hard vacuum to remove airborne contaminants and avoid the performance reducing effects of tiny air movements.

However the vast majority of vacuum chamber designs require seals for rotary drive shafts (called rotary feedthroughs) and ‘feedthroughs’ for the passage of materials, components, tools and finished products. In high vacuum applications conventional seals are unlikely to be able to achieve the performance specifications required, so magnetic fluid seals are used.

A ferrofluid is a stable colloidal suspension of sub-domain magnetic nano particles in a liquid carrier. The particles, which have an average size of about 100Å (10 nm), are coated with a stabilising dispersing agent (surfactant), which prevents particle agglomeration even when a strong magnetic field gradient is applied to the ferrofluid.

With over thirty years of experience producing seals for the world's most demanding applications, Ferrotec of Woolwich in London is able to optimise ferrofluid materials for the most extreme performance requirements and incorporate them into bespoke vacuum system designs.

“About half of our work is to bespoke design,” says Jeff Lewcock of Ferrotec, “and we have to test every seal to the nth degree to meet out customers specifications. To test the feedthrough it is mounted onto a vacuum chamber that is connected to a helium leak detector. Helium is then spayed onto the feedthrough and the leak rate observed during static and dynamic running.

As part of the test the starting and running torque of the seal are measured and the power loss through the seal is calculated. These readings allow Ferrotec to troubleshoot the individual seal, analyse the design’s performance and add to Ferrotec’s knowledge base.
“With the sort of tolerances we work to we needed a torque sensor that didn’t add any extra drag to the whole seal mechanism, so we were delighted to discover Sensor Technology’s non-contact TorqSense,” says Jeff.