

Upgrading O-Rings In Dynamic Applications

A well known OEM of plastic processing equipment was experiencing a high rate of field failure in one of their high temperature actuators. With an increasing number of failures occurring during the warranty period, there was an urgency to get a solution tested and out to their customers as quickly as possible.

The demands on the sealing solution were high, with the new seals having to meet a number of criteria:

- New sealing system must work in both hydraulic (70 BAR) and pneumatic (50 BAR) actuators.
- Maximum operating temperature is 210°C
- New seals must retrofit existing geometry, including high clearances.

After a thorough examination of the failed seals, System Seals determined that there were two modes of failure. The first is that the dynamic O-rings were rolling when the rod stroked, thus allowing fluid bypass and ultimately breakage of the seal. The second failure mode was leakage past the static seals whenever the gland deflected to one side.

The first upgrade was to replace the dynamic O-rings with System Seals profile types 161 and 261 in FKM. Utilizing the more robust profiles allowed us to prevent rolling, and reduce the number of seals from two O-rings down to one molded seal.

The grooves that were freed up were repurposed for guidance, where we specified the use of a custom size PTFE/Bz guide band. The inclusion of the guide bands prevented metal on metal contact, and eliminated the deflection that was causing leakage across the static seals.

The final result was an economical solution that eliminated warranty claims for the OEM and unplanned maintenance and lost opportunity costs for the end user.



CHALLENGE

High temperature actuators for plastic processing equipment were experiencing warranty failures in the field due to poor sealing performance and lack of rod guidance.

SOLUTION

System Seals replaced the dynamic O-rings with type 161 and 261 seal profiles, and retrofitted a redundant groove to provide much needed guidance.

RESULT

The change in seal profile solved the leakage issues, and the addition of proper guidance prevented metal-on-metal contact, eliminating warranty claims.