



Preventing Seal Failure in a Food Filling Process

A food and beverage manufacturer approached M Seals after experiencing recurring seal failures within the metalwork of a filling machine. The seals were swelling and breaking down prematurely, causing increased downtime and creating a potential product contamination risk. The customer needed a reliable solution that could withstand both the production environment and the cleaning process used on the equipment.

ASSESSMENT

M Seals carried out a site visit and inspected the failed seals and operating conditions. The seals showed clear signs of chemical attack, including swelling and material degradation. Based on the damage observed and a review of the customer's cleaning regime, it was determined that regular exposure to caustic soda was causing the failures. The existing seals were manufactured from NBR (Nitrile Rubber), which was not sufficiently resistant to the cleaning chemicals being used. While the seal material was unsuitable for the application, the seal geometry itself was found to be correct, meaning a redesign was unnecessary.

SOLUTION

Drawing on previous experience with similar applications, M Seals recommended replacing the NBR seals with EPDM, a material with excellent resistance to caustic cleaning agents and washdown procedures commonly used in the food industry.

To further enhance food safety, M Seals recommended upgrading to EC805 metal detectable FDA-compliant EPDM rubber. Alongside its excellent resistance to caustic cleaning chemicals, the material can be identified by metal detection and X-ray inspection systems, helping to minimise the risk of contaminated product reaching the end user.

EC805 is specifically designed for food-contact applications and offers a combination of chemical resistance, regulatory compliance and detectability. The material is ADI-free, migration tested in accordance with FDA 21 CFR 177.2600, and complies with EC1935/2004 and 3-A 18-03 Class 3 requirements.

Because the existing seal design was suitable, the customer was able to implement the material change quickly without modifying the equipment.

OUTCOME

Following installation of the new EPDM seals, the failures were completely eliminated. The new material successfully withstood the caustic cleaning process, preventing the swelling and degradation that had affected the previous seals.

As a result, the customer reduced unplanned downtime, improved equipment reliability and significantly lowered the risk of product contamination. By selecting a material better suited to the application and upgrading to a metal detectable grade, the customer achieved a long-term sealing solution that enhanced both operational performance and food safety.