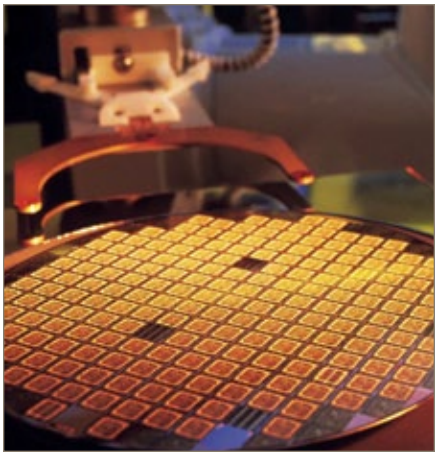
Parker WEAR-Lok™ Seals

Retrofitting Dovetail
and Undercut Grooves



Improve Seal Retention and Reduce Downtime

Parker's new patent-pending WEAR-Lok Seal for dovetail and undercut grooves offers significant advantages over traditional seal shapes where improved retention is needed. The WEAR-Lok Seal features intermittent "lobes" protruding from the sides of the seal which extend below the undercut feature retaining the seal in the groove but not affecting proper seal orientation.

The "lobe" features are designed to aggressively contact the groove walls providing reliable retention. The Parker WEAR-Lok Seal will remain deeply seated in a groove which has eroded beyond service limits when compared to a traditional seal shape.

Contact Information:

Parker Hannifin Corporation
Engineered Seals Division
501 South Sycamore Street
Syracuse, IN 46587

phone 574 528 9400
fax 574 528 9640

www.parkerseals.com

Product Features:

- Self retaining
- Improved stability
- Positive assembly
- Readily replace traditional seals of standard size
- Molded for custom Groove path

Benefits:

- Increased throughput
- Reduced downtime
- Reduced scrap
- Increased tool life
- Longer seal life

ENGINEERING YOUR SUCCESS.

Groove Challenges

Dovetail and undercut grooves are typically designed to provide retention of traditional seal shapes. Specifically, grooves are designed with a narrower opening width in order to "pinch" the seal into position.

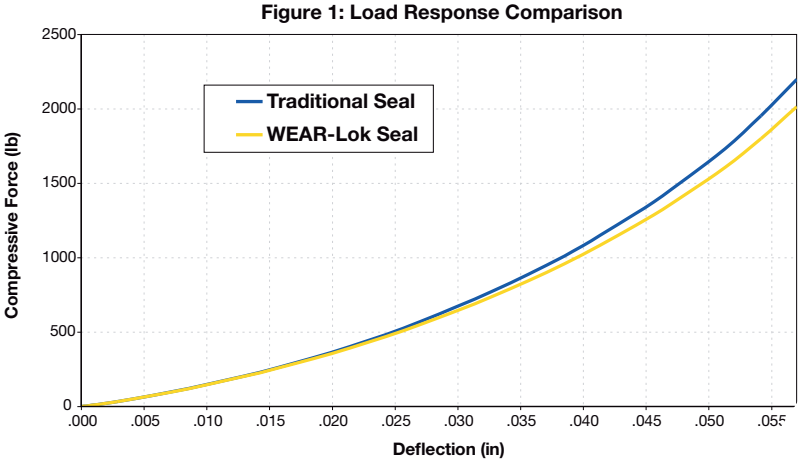
Often times, erosion of the dovetail groove occurs when the joint is opened and closed during normal operation. Wear at the pinch location eventually widens the groove to the extent that the seal is no longer adequately retained. When this occurs, the grooved component must be reworked or removed from service causing tool downtime.

More Than Just Manufacturing

The Engineered Seals Division is a leader in the design and manufacture of high performance sealing solutions. We offer a wide selection of molded shapes and composite seals made from standard elastomers to high purity perfluoroelastomers (FFKM) which are ideal for quick, easy and precise installation.

We partner with semiconductor customers to increase production efficiency through improving tool service life and uptime. At Parker, we develop and manufacture engineered sealing solutions for all applications including aggressive plasma chemistries, high temperature thermal processes, high pressures and ultra high vacuum.

Figure 1: Load Response Comparison



Case Study

Problem:

An equipment engineer in the semiconductor industry expressed frustration over increased downtime on a DPS tool. The upper chamber seal on the cathode assembly was exhibiting poor retention, which required the seal to be re-installed several times during routine maintenance cycles. The seal was also dislodging from the groove after a few cycles of lifting the chamber head following installation.

Each seal error caused a wet clean intervention taking four to six hours, two to four times a month creating a major challenge to the equipment engineer charged with maintaining optimum uptime and throughput.

Solution:

Parker engineers worked closely with the customer and determined groove erosion to be the root cause. The loss of tool uptime combined with the $19,000 replacement cost of the upper chamber body proved excessive.

To solve the problem, Parker's Engineered Seals Division designed and developed the patent pending WEAR-Lok Seal. Not only does the WEAR-Lok Seal address the retention issue, it is also engineered to match the load response of the traditional seal for proper wafer positioning and gap alignment (see Figure 1). The WEAR-Lok Seal solution has increased uptime and significantly improved total throughput.

ENGINEERING YOUR SUCCESS.