



Trouble Shooting Sealing Problems



What to Look for in a “Failed Seal”



- How did the seal fail?
- What was the system status?
- What is the performance history on this Pump and Seal?
- Make notes on system and equipment checks.
- Disassemble and visually inspect the seal.

WIDE WEAR TRACK ON MATING RING



POSSIBLE CAUSES

- Worn bearings
- Excessive shaft runnout
- Bent shaft
- Excessive vibration

CORRECTIVE ACTION

- Restore equipment to manufacturer's standards
- Operate equipment under stable conditions

INTERMITTENT SEAL FACE WEAR PATTERN



POSSIBLE CAUSES

- Face not flat
- Gland distortion (uneven tightening)
- Uneven mounting surface

CORRECTIVE ACTION

- Resurface distorted seal ring
- Use proper procedure to tighten gland fasteners

DEEP GROOVE ON SEAL FACE



POSSIBLE CAUSES

- Inadequate lubrication
- Abrasives in process fluid

CORRECTIVE ACTION

- Flush seal with a fluid with good lubricating qualities at an adequate flow rate
- Consider face materials that can withstand abrasive particles
- Prevent crystallization of process fluid

EXCENTRIC WEAR TRACK ON MATING RING



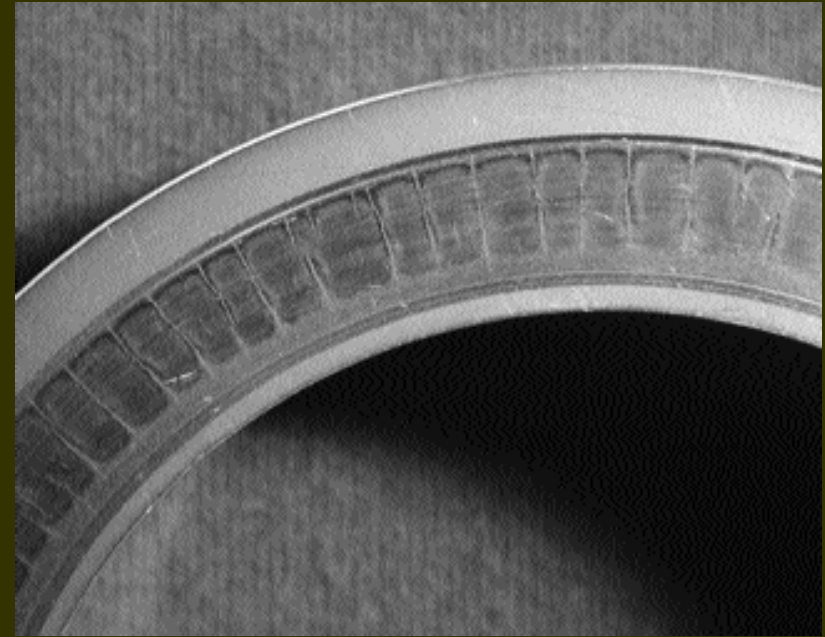
POSSIBLE CAUSES

- Rotor not centered with mating ring

CORRECTIVE ACTION

- Check alignment relationship of rotating to stationary parts

HEAT CHECKING



POSSIBLE CAUSES

- Inadequate face lubrication

CORRECTIVE ACTION

- Provide adequate, continuous lubricating flush to seal
- Consider face material change

FRACTURED or CRACKED SEAL FACE



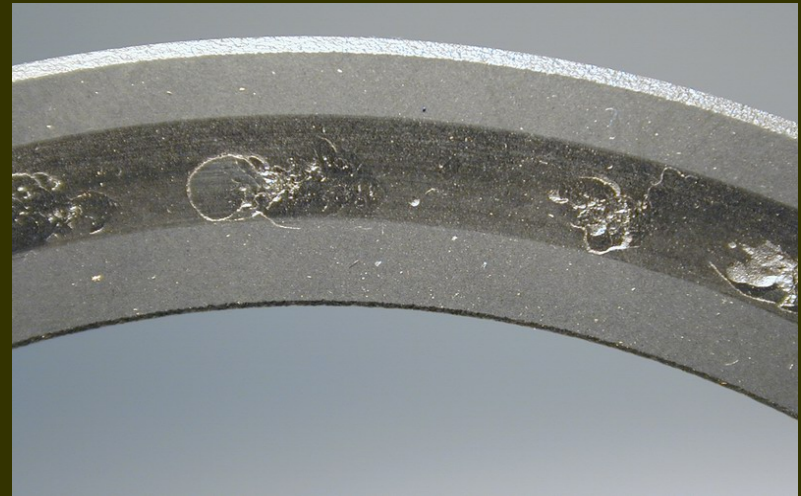
POSSIBLE CAUSES

- Thermal shock
- Mechanical shock or impact

CORRECTIVE ACTION

- Avoid uneven or over tightening of fasteners
- Maintain consistent flush to seal
- Determine cause of mechanical shock or impact

FACE BLISTERING and PULLOUTS



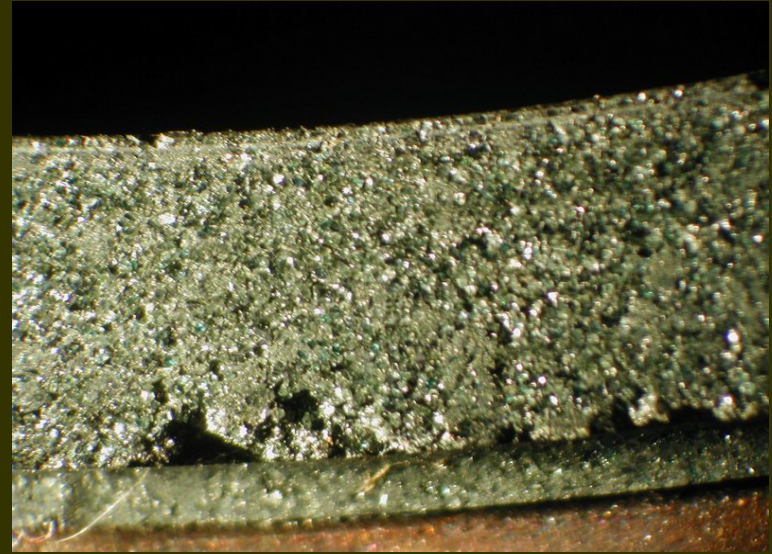
POSSIBLE CAUSES

- Process fluid too viscous for the face material
- Adhesive condition caused by fluid physical property change in the interface, resulting from viscous shear or heating of the fluid

CORRECTIVE ACTION

- Provide adequate cooling
- Change face materials

PITTING, LEACHING, or GENERAL CORROSION



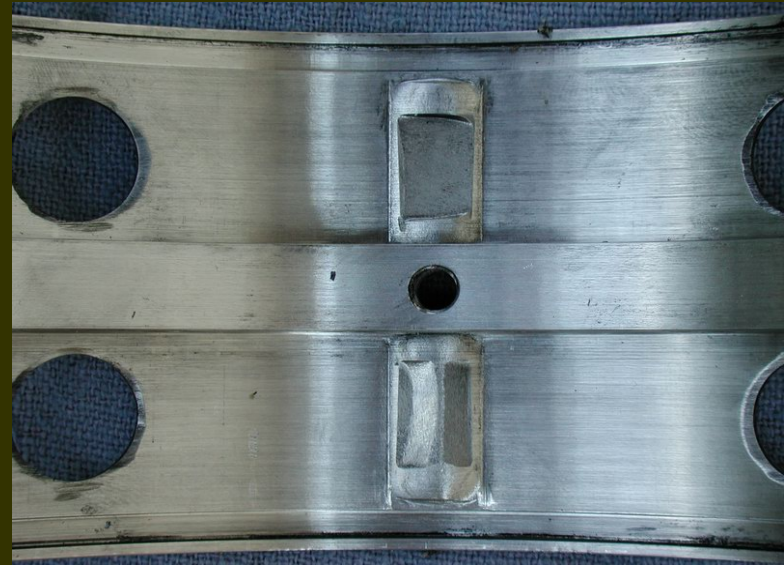
POSSIBLE CAUSES

- Chemical attack of material or one or more of its constituents

CORRECTIVE ACTION

- Change materials

WORN DRIVE COMPONENTS



POSSIBLE CAUSES

- Frequent equipment starts and stops
- High torque
- Vibration, seal misalignment

CORRECTIVE ACTION

- Maintain seal and equipment alignment
- Review design for applicability to application

CHIPS, CRACKS IN SEAL RING



POSSIBLE CAUSES

- Mishandling of parts
- Improper installation

CORRECTIVE ACTION

- Follow proper installation procedure
- Avoid point contact or sudden impact of brittle face materials

O-RING SWELL



POSSIBLE CAUSES

- Chemical attack

CORRECTIVE ACTION

- Change elastomer to one appropriate for the fluid being pumped

ELASTOMER WITH CUTS & NICKS



POSSIBLE CAUSES

- Improper installation technique
- Sharp steps/surface breaks on mounting surface

CORRECTIVE ACTION

- Use chamfers on shaft and sleeve steps
- Remove sharp edges at keyways, threads, etc.

HARD or CRACKED ELASTOMERS



POSSIBLE CAUSES

- Thermal breakdown of compound
- Chemical attack

CORRECTIVE ACTION

- Cool seal chamber
- Select elastomer appropriate for process fluid

SPRING DISTORTED, CRACKED, BROKEN, CORRODED



POSSIBLE CAUSES

- Excessive shaft speed
- Metal corrosion
- Metal fatigue

CORRECTIVE ACTION

- Select proper metallurgy for sealing application
- Select appropriate type of spring for application



Questions??