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Give your sealing systems the best chance for survival. Take time to check out these seal-optimization strategies.

This is a true story. When an OSHA team noticed fluid on the shop floor at a manufacturing plant undergoing a routine inspection, the operation was faced with a potential shutdown that would cripple productivity and cost thousands of dollars in equipment downtime. Detective work found that an improperly installed seal was causing the leak. The fix? All it took was a relatively inexpensive (and properly installed) replacement seal.

In simple terms, seals protect bearing arrangements in rotating machinery, optimize bearing service life and reliability, prevent contamination—*and can help keep OSHA and EPA leakage issues at bay* . Seals, however, can fail for a variety of reasons, including, improper installation, change of lubricant (leading to adverse reactions in common sealing materials) and/or improper selection.

Seal Opimization Checklist

You can help extend the life of all types of seals by checking these conditions:

- Never re-use a worn seal.
- Seal stored properly in cool area (not work area) at 40-70% humidity.
- Packaging intact, seal lip not distorted by handling or hanging on peg or nail.
- Installation tools correct.
- Area clean and free of grit or contamination.
- Correct seal for speed.
- Correct seal for media.
- Check operating temperature against lip material specificiations.
- Lubricant, including additives, must be compatible with seal lip material.
- The leading edge of the shaft should be chamferred. Shaft finish should be 9-17 micro inches Ra (.23-.43 micro meters) with a machine lead angle of 0±0.05 degrees.

- Shaft hardened to Rockwell C 30 or harder.
- Tolerances for shaft diameter must be within range.
- Shaft-to-bore misalignment within .010" (0.25 mm).
- Dyanmic run-out within .010" (0.25 mm) TIR.
- Whenever possible, equipment should be vented to the atmosphere to help prevent pressure build-up.

Troubleshooting your seals

As outlined here, whenever "good seals go bad," the best way to troubleshoot is to ask the right questions and then follow a sequence of steps to analyze sealing system failures.

Ask…

Start with these questions:

- ***What is the seal supposed to do and how well has it performed in the past?*** If there is a history of failures, the culprit may not be the seal.

- ***Is it the right seal?*** Check the seal's part number and review recommended applications. If the correct seal has been installed properly and there is no history of repeated failures, the problem will require further investigation.
- ***What is the source of the leak?*** It will be helpful as a reference point to determine whether the leak is in the inner diameter or the outer diameter of the seal. In addition, documenting when the leak first occurred may link the leakage to a change in maintenance or operating procedures.
- ***In the case of exceptional seal wear, what is the cause?*** Failure analysis will almost always be necessary to come up with the right answer.

Analyze...

The following actions are among the basic recommended steps to analyze sealing system failures:

- ***Inspect the seal before it is removed.*** Check the condition of the area and note the amount (and apparent source) of leakage that has occurred.

- ***Wipe the area clean*** and look for nicks on the bore chamfer, cocked seal in the bore, improper installation, shaft-to-bore misalignment, looseness or a deformed seal case. All can

impact seal effectiveness.

- ***Rotate the shaft*** to determine whether there is excessive end-play or excessive run-out. Those conditions can indicate misalignment issues.
- ***When the seal is removed,*** check for rough bore surface, shaft cleanliness, coked lube on the seal, shaft damage, flaws or voids in the bore and shaft corrosion or discoloration. These will influence seal performance.
- ***Ascertain the seal style and materials*** and then inspect for excessive lip wear. This condition may be a sign that the seal is not getting enough lubrication or that the shaft could be corroded.

Taking these actions can help you pinpoint a problem and lead to appropriate corrective measures for optimized sealing-system performance and outcomes. **MT**

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Editor's NoteFor a number of years after its acquisition of the venerable Chicago Rawhide company, SKF continued to operate it using variations of the SKF, CR and Chicago Rawhide brands. Later, the CR and Chicago Rawhide brands were transitioned into the universally recognized SKF brand.

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