
Centrifugal Pump Mechanical Seal Inspection And Greasing

1.0 Maintenance Objective & Frequency

The objective of this procedure is to inspect the mechanical seal assembly for wear, damage, or leakage, and to apply the correct grease to the seal cavity to ensure proper lubrication and heat dissipation. This PM prevents premature seal failure, reduces unplanned downtime, and maintains pump efficiency.

Frequency: Every 2000 operating hours or 6 months, whichever comes first. Perform more frequently if the pump handles abrasive or hot fluids.

2.0 Lockout/Tagout (LOTO) & Safety

- **Electrical Isolation:** Disconnect and lock out the pump motor at the motor control centre (MCC). Verify zero voltage with a voltmeter.
- **Mechanical Isolation:** Close and lock out the suction and discharge isolation valves. Place a blind flange if required by site policy.
- **Thermal Hazard:** Allow the pump to cool to below 40°C if it has been handling hot fluids.
- **PPE:** Safety glasses, chemical-resistant gloves, steel-toed boots, and a face shield when handling grease or cleaning solvents.
- **Spill Containment:** Place absorbent pads under the seal area to catch any residual fluid or grease.

3.0 Required Tools, Parts & Lubricants

- Mechanical seal grease (e.g., Kluber Petamo GHY 133 or equivalent per OEM spec)
- Grease gun with compatible coupler
- Clean lint-free rags
- Flashlight or inspection mirror
- Feeler gauge set (0.001-0.020 inch)
- Torque wrench (0-150 in-lb range)
- Allen key set (metric/imperial as required)
- Caliper or micrometer (for seal face measurement if replacement is needed)
- Lockout/tagout kit
- Disposable gloves and safety glasses

4.0 Step-by-Step Maintenance Procedure

1. Perform LOTO as per Section 2.0. Verify that the pump is isolated and depressurized.
2. Remove the coupling guard and inspect the coupling for wear or misalignment. Document any findings.

3. Remove the seal housing bolts or gland nuts using the appropriate Allen key or wrench. Carefully slide the seal housing back to expose the mechanical seal.
4. Visually inspect the stationary and rotating seal faces for scoring, pitting, cracks, or discoloration. Use a flashlight and inspection mirror to see all surfaces.
5. Check the seal faces for flatness using a feeler gauge. Place the gauge between the faces at three points around the circumference. Acceptable gap is less than 0.001 inch (0.025 mm). If greater, the seal must be replaced.
6. Inspect the O-rings and gaskets for cuts, swelling, or hardening. Replace if any damage is found.
7. Clean the seal cavity and all mating surfaces with a lint-free rag. Remove any old grease, debris, or fluid residue.
8. Apply a thin, even layer of mechanical seal grease to the seal faces and the O-ring grooves. Use only the grease specified by the OEM.
9. Reassemble the seal housing, ensuring the gland nuts are torqued evenly in a cross pattern to the OEM specification (typically 15-25 in-lb). Do not overtighten.
10. Reinstall the coupling guard and remove all tools and rags from the work area.

5.0 Verification & Return to Service

1. Remove LOTO devices and restore power to the pump motor.
2. Slowly open the suction valve, then the discharge valve. Monitor the seal area for any immediate leakage.
3. Start the pump and run it at operating speed for 5 minutes. Listen for unusual noise (squealing or grinding) and check for leaks at the seal.
4. Measure pump vibration using a handheld vibrometer if available. Compare to baseline readings (typically <0.15 in/sec).
5. Record the inspection results, grease type, and any parts replaced in the PM work order in ServiceGrid. Sign off and close the work order.

Regulatory Disclaimer: This document is a generic maintenance template provided for educational and informational purposes only. It does not constitute professional engineering or reliability advice. The end-user assumes all liability for validating all step sequences, torque specs, and LOTO protocols against specific machinery OEM manuals before deployment to a live production floor.