



# ADVANCED SEALING TECHNOLOGY INSTALLATION INSTRUCTIONS

## AST 70 SINGLE CARTRIDGE SEAL

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The seal must be installed in accordance with these instructions, the equipment manufacturer's instructions, and plant safety requirements. If you are in doubt about any phase of installing this mechanical seal, stop the installation and get assistance. The decision to use any AST mechanical seal in a particular service is the customer's responsibility. If the pumped fluid is hazardous or toxic, appropriate precautions must be taken to contain any seal leakage.

### PREPARATION

1. Follow plant safety regulations prior to equipment disassembly:
  - lock out motor and valves
  - wear designated personal safety equipment
  - relieve any pressure in the system
  - consult plant MSDS files for hazardous material precautions
2. Disassemble the pump in accordance with manufacturer's instructions so the seal can be installed over the end of the shaft.
3. The shaft or sleeve diameter must be within  $+ .000/- .002$  inch of nominal size. The shaft must be smooth ( $32 \mu$  inch  $R_a$ ) and free from nicks, grooves, and corrosion. Replace the sleeve or shaft if worn. Remove all sharp edges and burrs from shaft keyways, threads, and edges where the O-ring will slide.
4. Maximum shaft runout at seal chamber face is  $.002$  inch FIM. To measure, mount dial indicator on seal chamber and indicate shaft while rotating shaft.
5. Maximum axial movement of shaft (end play) is  $.005$  inch FIM. To measure, mount dial indicator on shaft and indicate seal chamber face while moving shaft axially.
6. The seal chamber face must be smooth ( $63 \mu$  inch  $R_a$ ) and free of nicks, burrs, and corrosion.
7. Maximum out-of-squareness of the seal chamber face to the shaft is  $.002$  inch FIM, ( $.003$  inch FIM for shaft size  $> 3$  inch). To measure, mount dial indicator on shaft and indicate seal chamber face while rotating shaft.
8. If the seal gland is piloted to the seal chamber, the register surface must be concentric to the shaft within  $.005$  inch FIM.
9. The O-ring elastomer installed in the seal is identified on the seal drawing. There may also be an alternate set of O-rings packaged with the seal. Determine what O-ring elastomer is suitable for your application by consulting an O-ring compatibility table. Be sure the correct O-rings for your application are installed in the seal.

### INSTALLATION

1. Lubricate the shaft sparingly with silicone lubricant (supplied with the seal) or with other lubricant compatible with the O-rings and your machinery and product. Do not use petroleum lubricants on EP O-rings. Make sure the gland O-ring or gasket is in place.
2. Slide the AST 70 seal onto the shaft. If the seal doesn't slide over the shaft, make sure the set screws do not extend into the bore of the seal sleeve. Don't loosen the three red half dog point set screws more than one-half turn—they hold the seal together.
3. Reassemble the pump components. Orient the seal gland with the flush port up, if access to piping permits.
4. Check and reset the impeller clearance if required. The impeller can be reset at any time when the centering blocks are in place and the set screws are loosened (not more than one-half turn).
5. Push on the lock ring to bring the gland O-ring or gasket in contact with the seal chamber face. Install and tighten the gland nuts evenly in a diagonal sequence.
6. Connect and align piping and motor coupling.
7. Make sure the centering blocks contact the back face of the gland. Tighten all the set screws in the lock ring with the hex key provided with the seal.
8. Remove the centering blocks and screws. Save them to reset the seal after impeller adjustment or seal removal.
9. Rotate the shaft by hand to check for obstructions or contact. Do not start the equipment dry.

### PIPING AND OPERATION

1. Install an appropriate seal flush system. The flush line should be connected to the seal gland. A flush from a clean external source (API Plan 32) can always be used, and should be used for abrasive services. For clean cool products, use a discharge bypass (API Plan 11) or a suction bypass (API Plan 13). For clean hot products, use a discharge bypass through a cooler (API Plan 21), preferably with a throat bushing. Vertical pumps should be piped to vent air from the seal.
2. Do not start the pump dry. Open valves to flood the pump. Vent air from the pump casing and seal chamber. Make sure the seal flush lines are clear.
3. Observe the startup from a safe distance. If the seal runs hot or squeals, stop the pump and check the flush system and gland centering.

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