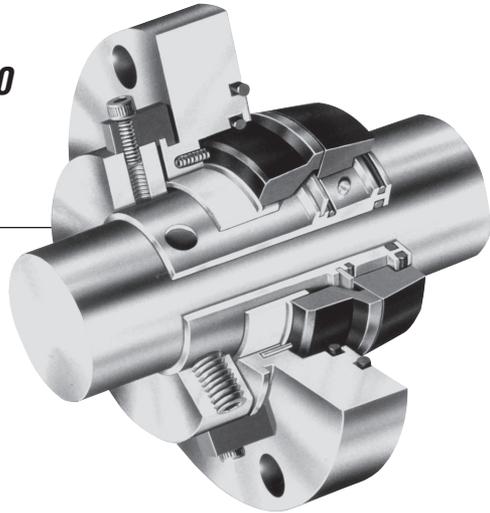


***Durametallic[®] SL-5000
and SL-5200 Seals***

Cartridge Slurry Seals

**1 Equipment Check**

- 1.1 Follow plant safety regulations prior to equipment disassembly:
 - 1.1.1 Wear designated personal safety equipment
 - 1.1.2 Isolate equipment and relieve any pressure in the system
 - 1.1.3 Lock out equipment driver and valves
 - 1.1.4 Consult plant Safety Data Sheet (SDS) files for hazardous material regulations
- 1.2 Disassemble equipment in accordance with the equipment manufacturer's instructions to allow access to seal installation area.
- 1.3 Remove existing sealing arrangement (mechanical seal or otherwise). Clean seal chamber and shaft thoroughly.
- 1.4 Inspect surfaces under gaskets to ensure they are free from pits or scratches. Break all sharp corners on shaft steps, threads, reliefs, shoulders, key ways, etc. over which gasket(s) must pass and/or seal against.
- 1.5 Check shaft or sleeve OD, seal chamber bore, seal chamber depth, gland pilot, stud diameter, stud bolt pattern and distance to first obstruction to ensure they are dimensionally the same as shown in the seal assembly drawing.
- 1.6 Check seal assembly drawings for any modifications (reworks) to be made to the equipment for mechanical seal installation and act accordingly.
- 1.7 The equipment must be earthed to prevent sparks due to static electricity discharge.

Shaft runout should be checked against the equipment manufacturer's specifications.

Generally, should not exceed 0.05 mm (0.002 inch) TIR (Total Indicator Reading) at any point along the shaft for ball or roller type bearings. For sleeve type bearings, refer to manufacturer instructions. If the equipment is not completely dismantled, verify runout near seal location.

The above values apply to shaft speeds in the range from 1000 to 3600 RPM. For values above and below, consult your Flowserve representative. See Figure 1.

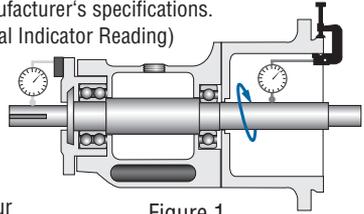


Figure 1

Shaft endplay should not exceed 0.25 mm (0.010 inch) TIR, regardless of thrust bearing type. See Figure 2.

Radial bearing play at seal chamber face should be checked against the equipment manufacturer's specifications. Generally 0.05 - 0.10 mm (0.002 - 0.004 inch) will be applicable for ball or roller type bearings. For sleeve or journal type bearings, values will generally be in the order of 0.10 - 0.15 mm (0.004 - 0.006 inch). If equipment is found outside the general range, contact the equipment manufacturer and your Flowserve representative to verify the equipment's suitability for the seal.

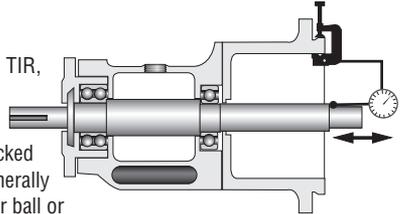


Figure 2

Seal chamber squareness to the shaft centerline should be within 0.0005 mm/mm (0.0005 inch/inch) of seal chamber bore TIR.

Note: make sure that shaft endplay does not affect the reading. Verify the smoothness of the seal chamber face for a good gasket joint. See Figure 3.

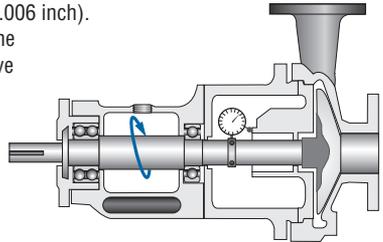


Figure 3

Concentricity of the shaft to the seal chamber bore or gland pilot register should be within 0.025 mm per 25 mm shaft diameter (0.001 inch per 1 inch shaft diameter) to a maximum of 0.125 mm (0.005 inch) TIR. See Figure 4.

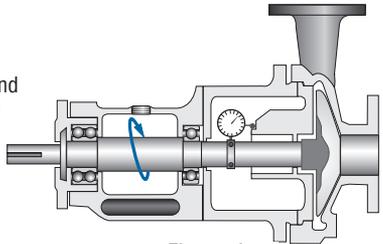
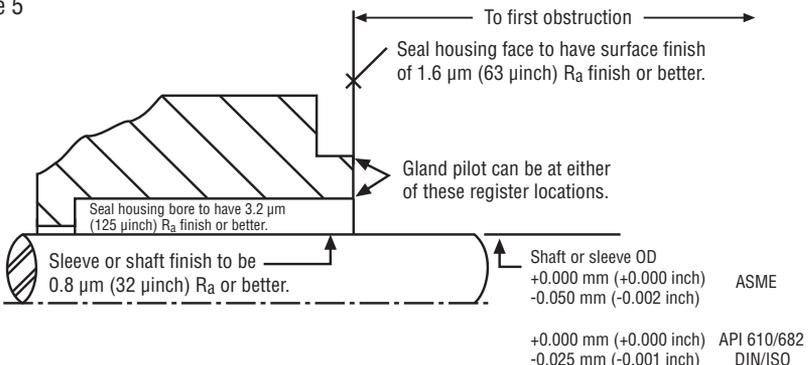


Figure 4

Surface finish requirements

Figure 5



SL-5000 and SL-5200 Cartridge Seals are complete preset seal assemblies which include the sleeve and gland. No seal settings or measurements are required. They are especially suitable for pumps and rotating equipment handling abrasive slurries. The SL-5000 is a single seal design and the SL-5200 is a dual seal.

2 Installation

- 2.1 **Lubricate the shaft** lightly with silicone lubricant before installing the seal assembly on the shaft.
- 2.2 **Install the complete cartridge seal assembly** over the shaft and ease it into position. Care should be exercised when passing the sleeve incorporating the O-ring over any keyways or threads that may be present. Any steps or shoulders on the shaft should be beveled to prevent damage (pinching and cutting) of the O-ring sleeve gasket during installation. **Attach the gland bolts loosely, hand tight**, to the face of the seal chamber.
- 2.3 After the pump assembly has been completed with the impeller, shaft, coupling, and bearing in their respective running or operating position, **tighten the gland bolts to the seal chamber**, evenly cross staggering the adjustment of the bolts.
- 2.4 Be sure the set screw material is harder than the shaft material to bite into the shaft and hold the required load. **Tighten the sleeve collar set screws to the shaft** by cross staggering the adjustment.
- 2.5 Remove the setting devices from between the sleeve drive collar and gland, and store for future use.
- 2.6 The seal is set and ready for operation.

Operational Recommendations

3 SL-5000

- 3.1 **Do not start the equipment dry.** Never start up the equipment without properly venting the pump of air.
- 3.2 If the seal runs hot, check for proper seal setting, seal housing dimensions, and check the flush lines for obstructions. Do not allow the equipment to run for any extended time if the seal gets hot or squeals.

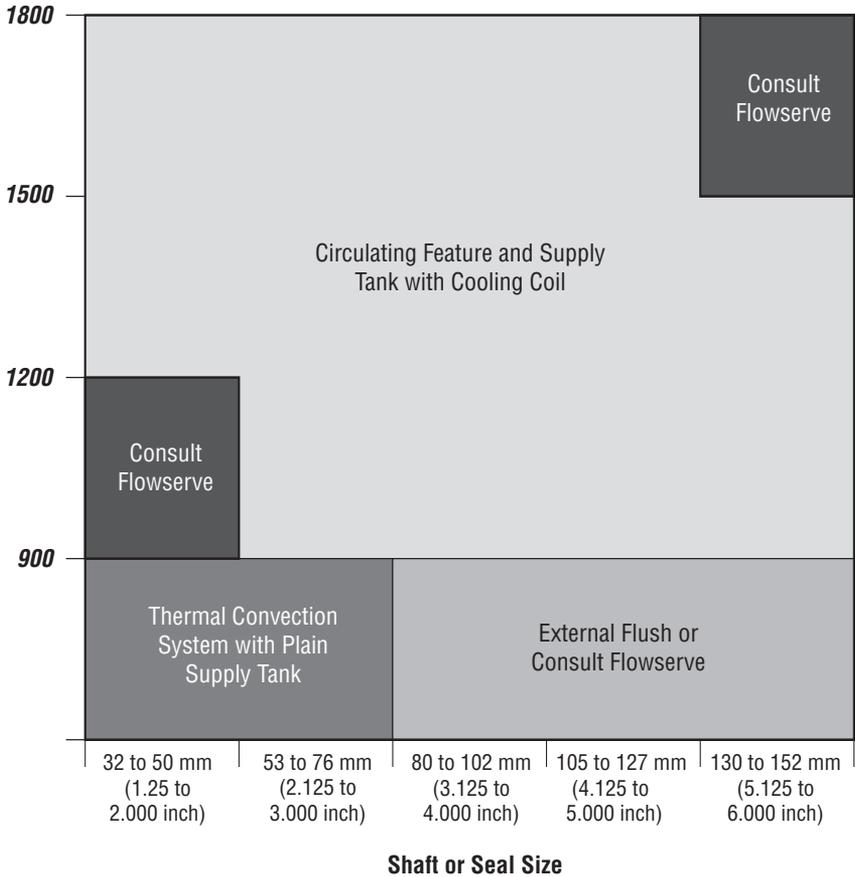
The images of parts shown in these instructions may differ visually from the actual parts due to manufacturing processes that do not affect the part function or quality.

Figure 6 contains guidelines for buffer fluid systems which can be used with the SL-5200 double seal. Figure 3 is a suggested piping arrangement for the SL-5200 with circulating feature and supply tank with cooling coil. For other sealing liquid systems using Dura Circulators, external flushing or thermal convection, refer to the assembly drawing or consult Flowserve, Flow Solutions for instructions.

- 4.1 Always start up the sealing liquid supply before starting equipment. Be sure that the sealing liquid pressure is greater than the maximum pressure of the process fluid acting on the seal chamber.
- 4.2 Seal liquid pressure must not exceed the pressure velocity rating of the seal design and materials of construction.
- 4.3 Be sure cooling water to supply tank or circulator is on.
- 4.4 Never start up equipment dry. Properly vent all air.
- 4.5 If the seal runs hot or squeals, check the seal liquid flow between the seals and check the seal housing dimensions to insure that the seal is not over-compressed.

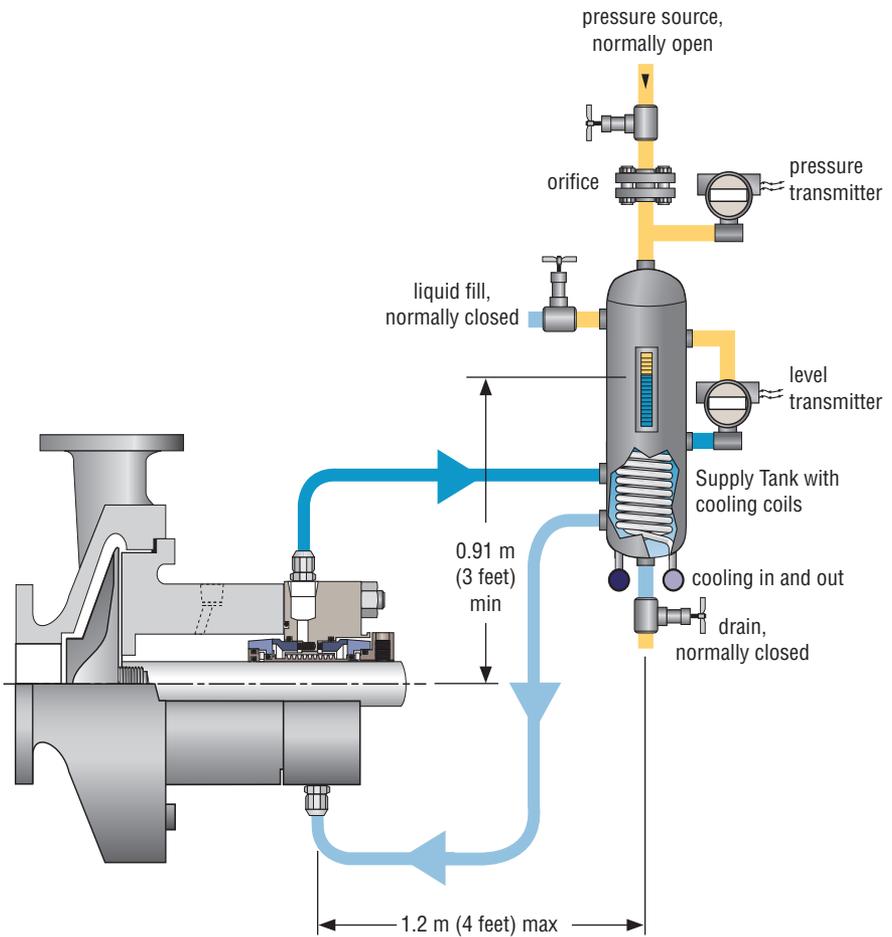
For special problems encountered during installation, contact your nearest Flowserve Sales and Service Representative or Authorized Distributor.

RPM



Notes

1. Recommendations are for use with a water buffer fluid only.
2. These recommendations apply to products having a maximum temperature of 71°C (160°F).
3. Systems can be applied at the seals maximum pressure limit according to PV curve 2D-255497.
4. In most cases other systems can be successfully applied. Consult Flowserve for other options.



5 Repair

This product is a precision sealing device. The design and dimension tolerances are critical to seal performance. Only parts supplied by Flowserve should be used to repair a seal. To order replacement parts, refer to the part code and B/M number. A spare backup seal should be stocked to reduce repair time.

When seals are returned to Flowserve for repair, **decontaminate the seal assembly** and include an order marked "**Repair or Replace.**" **A signed certificate of decontamination** must be attached.

A Safety Data Sheet (SDS) must be enclosed for any product that came in contact with the seal. The seal assembly will be inspected and, if repairable, it will be rebuilt, tested, and returned.



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