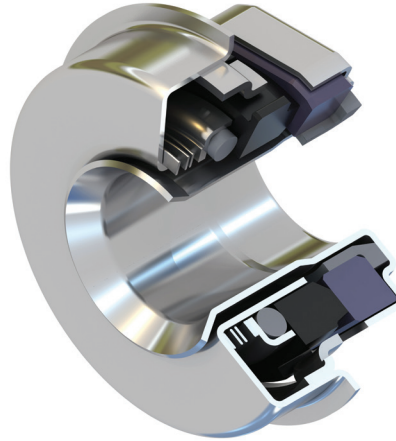




Installation Instructions

ASP-X

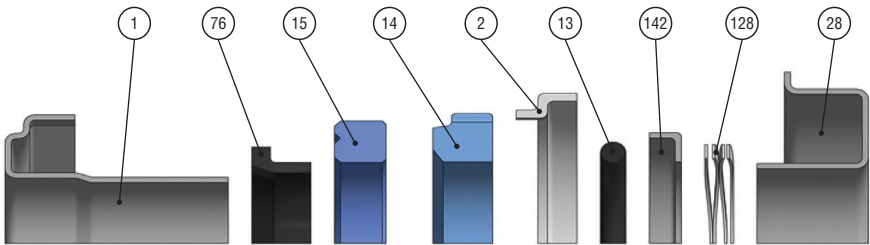
Mechanical Shaft Seal



Description

As part of the Advanced Stationary Pusher (ASP) series, the **ASP-X** seal is optimized for improved performance in belt-driven engine coolant pumps. The **ASP-X** seal utilizes stamped metal components (shells, sleeves, drives and gasket holders) and a single-wave spring in a unitized stationary flexible element pusher seal design.

ASP-X Seal Nomenclature



Part Reference	Description
1	Sleeve
76	Rotating Face Gasket
15	Rotating Face
14	Stationary Face
2	Seal Drive

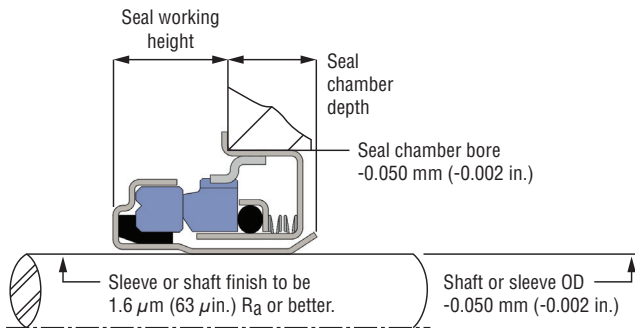
Part Reference	Description
13	Seat Gasket
142	Retainer
128	Wave Spring
28	Shell

1 Equipment Checks

- 1.1 Follow plant safety regulations prior to equipment disassembly, including but not limited to the following:
 - Lock out equipment driver and valves.
 - Wear designated personal safety equipment.
 - Isolate equipment and relieve any pressure in the system.
 - 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.
 - If necessary, remove existing sealing arrangement (mechanical seal or otherwise).
- 1.3 Check seal documentation for seal design and materials of construction.
- 1.4 Check shaft or sleeve outer diameter (OD), seal working height, seal chamber bore and seal chamber depth to ensure they are dimensionally within the tolerances shown on the seal assembly drawing. See Figure 2.

Seal Chamber Requirements

Figure 2



- Bearings must be in good condition.
 - Maximum lateral or axial movement of shaft (end play) = $0.25 \text{ mm} [0.010 \text{ in.}]$ FIM
 - Maximum shaft runout at face of seal housing = $0.05 \text{ mm} [0.002 \text{ in.}]$ FIM
 - Maximum dynamic shaft deflection at seal housing = $0.05 \text{ mm} [0.002 \text{ in.}]$ FIM
 - Verify proper shaft and bore lead in chamfers are present and within specifications. Difficulty and damage can be observed during seal installation without proper lead in chamfers.
- 1.5 Thoroughly inspect and clean the seal chamber and shaft or pump sleeve. Inspect for corrosion or any defects. Remove all burrs, cuts, dents or defects that might damage gaskets or allow a leak path. Replace worn shaft or pump sleeve.
 - 1.6 Check equipment requirements as described in Figure 2. Any measurement different than what is allowed must be brought within specifications.
 - 1.7 Handle the seal with care; it is manufactured to precise tolerances. The seal faces are of special importance and should be kept clean at all times.

2 ASP-X Seal Installation: Without Installation Tool

- 2.1 Review seal drawing for the seal working height and mark the shaft with an indicator of the seal's working height.
- 2.2 Lubricate the shaft or sleeve lightly. Use a water-based lubricant (Pac-Ease recommended). If Pac-Ease is not available, use a solution of liquid dish soap in water as a lubricant.
 - *Note: Never use grease or oil as an installation lubricant. Oil used to lubricate the sleeve will significantly reduce the friction drive or anti-rotation capability of the component.*
- 2.3 Lubricate the OD of the stationary seal shell cup with Pac-Ease. If Pac-Ease is not available, use a solution of liquid dish soap in water as a lubricant.
 - *Note: Never use grease or oil as an installation lubricant. Oil used to lubricate the sleeve will significantly reduce the friction drive or anti-rotation capability of the component.*
- 2.4 Pushing on the lip of the seal shell, slide the seal assembly by hand along the shaft until the seal shell makes initial contact with the edge of the seal chamber bore. Take care not to press the seal into place by pushing on the seal sleeve end.
 - *Note: Pushing the seal into place by pressing on the seal sleeve could damage the internal components of the seal.*
- 2.5 Press the seal shell into the seal chamber bore by pressing on the seal shell lip until the seal shell lip is seated flush against the seal chamber face. Take care not to press the seal into place by pushing on the seal sleeve end.
 - *Note: Pushing the seal into place by the pressing on the seal sleeve could damage the internal components of the seal.*
- 2.6 Press on the end of the seal sleeve to set it to its working height.
 - *Note: Pushing the sleeve significantly past its working height could damage the internal components of the seal.*

3 ASP-X Seal Installation: With Installation Tool

- 3.1 Lubricate the shaft or sleeve lightly. Use a water-based lubricant (Pac-Ease recommended). If Pac-Ease is not available, use a solution of liquid dish soap in water as lubricant.
 - *Note: Never use grease or oil as an installation lubricant. Oil used to lubricate the sleeve will significantly reduce the friction drive or anti-rotation capability of the component.*
- 3.2 Lubricate the OD of the stationary seal shell cup with Pac-Ease. If Pac-Ease is not available, use a solution of liquid dish soap in water as a lubricant.
 - *Note: Never use grease or oil as an installation lubricant. Oil used to lubricate the sleeve will significantly reduce the friction drive or anti-rotation capability of the component.*
- 3.3 Pushing on the lip of the seal shell, slide the seal assembly by hand onto the shaft until it is fully supported on the equipment shaft. Take care not to press the seal into place by pushing on the seal sleeve end.
 - *Note: Pushing the seal into place by pressing on the seal sleeve could damage the internal components of the seal.*
- 3.4 Place the installation tool over the shaft until it contacts the seal assembly.
 - *Note: Initial contact between the installation tool to the seal will be on the seal sleeve. The tool will push the sleeve until it contacts the lip of the seal shell.*
- 3.5 Press on the installation tool, press the seal into initial contact with the seal chamber bore, and then press the seal into the seal chamber until the seal shell lip is seated flush against the seal chamber face.

4 ASP-X Seal Operational Recommendations

- 4.1 Remove lock-outs on equipment and valves.
- 4.2 Do not start up the pump dry to check motor rotation or for any other reason. Open valves to flood pump with product fluid. Vent air from the casing of the pump and the seal chamber before start-up.
- 4.3 Observe the start-up. If the seal runs hot or squeals, do not allow the pump to run for any extended time.
- 4.4 The seal is designed to resist corrosion through proper material selection. Do not expose the seal materials of construction to products outside of their corrosion limits. Consult Flowserve for chemical resistance recommendations.
- 4.5 Do not exceed pressure and speed limits established for the seal.
- 4.6 Do not exceed temperature limits of the seal based on the material of construction.



TO REORDER, REFER TO

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SSIOM000514-00 (EN) March 2022