

170L Slurry Single Cartridge Seal—Wet Version

Designed to Fit Weir™ AH Series Pump

Installation, Operation and Rebuild Instruction



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Seal Data Reference

(from Box Label)

ITEM # _____

SEAL _____

(example 170L 100mm SSC/TC)

INSTALLATION DATE _____

1.0 CAUTIONS

These instructions are general in nature. It is assumed that the installer is familiar with seals and certainly with the requirements of their plant for the successful use of mechanical seals. If in doubt, get assistance from someone in the plant who is familiar with seals or delay the installation until a seal representative is available. All necessary auxiliary arrangements for successful operation (heating, cooling, flushing) as well as safety devices must be employed. These decisions are to be made by the user. The decision to use this seal or any other Chesterton seal in a particular service is the customer's responsibility.

Do not touch the mechanical seal for any reason while it is operating. Lockout or uncouple the driver prior to personnel contact with the seal. Do not touch the mechanical seal while it is in contact with hot or cold fluids. Ensure that all the mechanical seal materials are compatible with the process fluid. This will prevent possible personal injury.

2.0 TRANSPORT AND STORAGE

Transport and store seals in their original packaging. Mechanical seals contain components that may be subject to alteration and ageing. It is therefore important to observe the following conditions for storage:

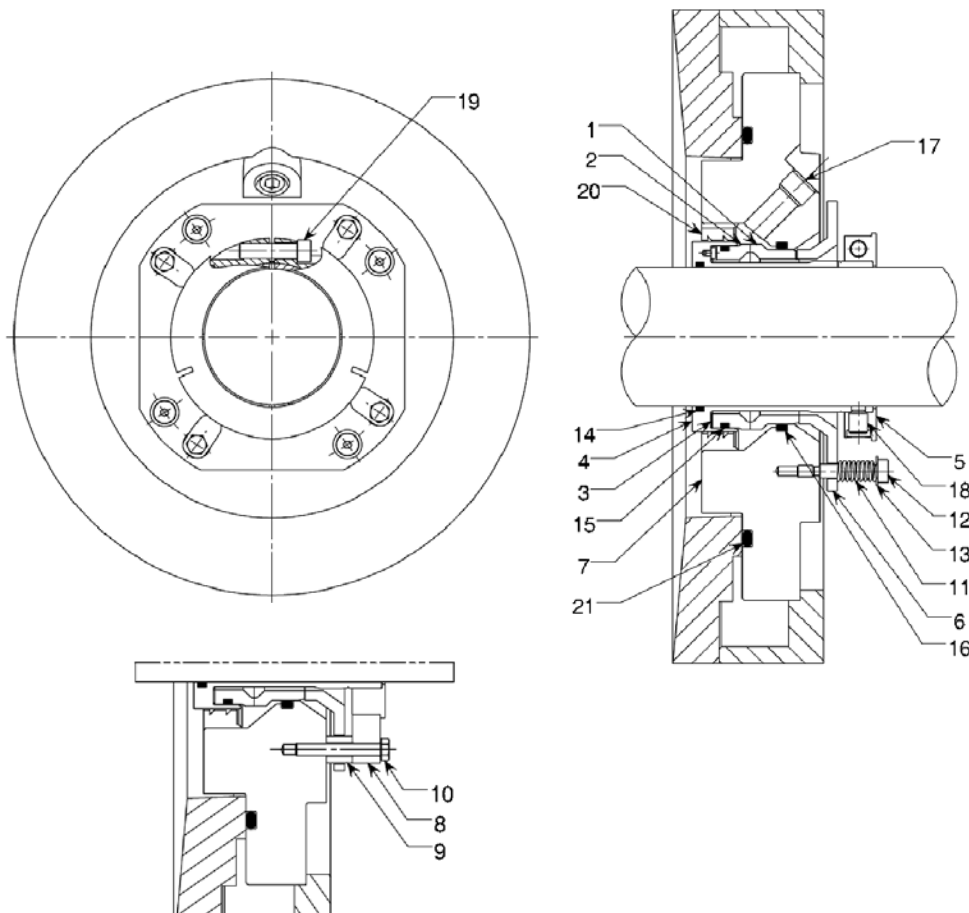
- Dust free environment

- Moderately ventilated at room temperature
- Avoid exposure to direct sunlight and heat
- For elastomers, storage conditions according to ISO 2230 should be observed

3.0 DESCRIPTION

3.1 Parts Identification

3.1.1 Clamped Gland Configuration



KEY

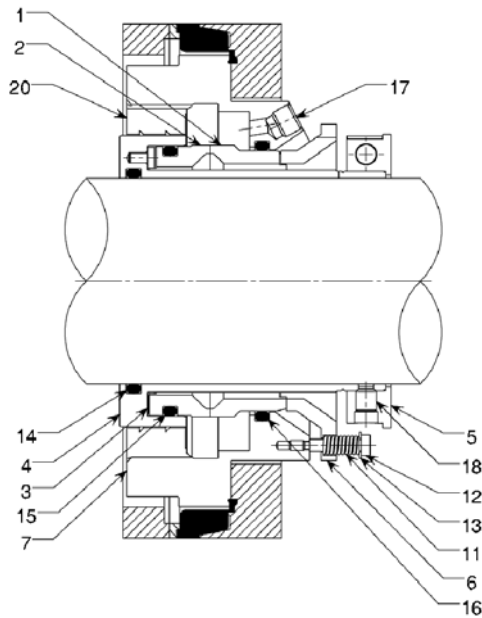
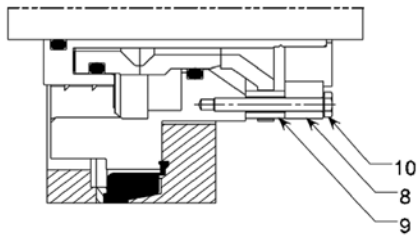
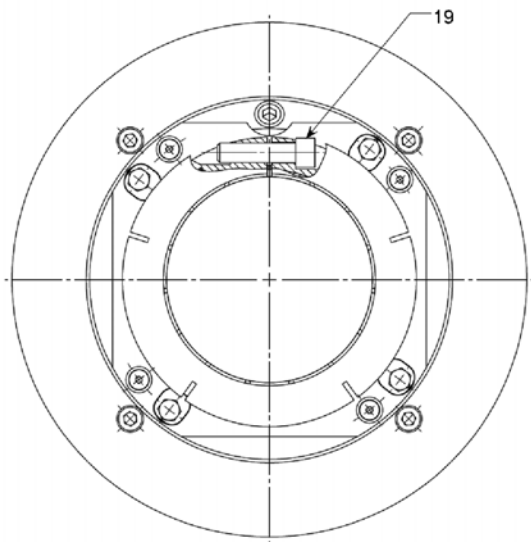
- 1 – Stationary Seal Ring
- 2 – Rotary Seal Ring
- 3 – Rotary Gasket
- 4 – Sleeve Assembly
- 5 – Lock Ring Assembly
- 6 – Pusher
- 7 – Gland
- 8 – Centering Clip
- 9 – Centering Clip Spacer
- 10 – Hex Screw
- 11 – Spring
- 12 – Shoulder Screw
- 13 – Washer
- 14 – Shaft O-Ring
- 15 – Rotary O-Ring
- 16 – Stationary O-Ring
- 17 – Pipe Plug
- 18 – Dog Point Set Screw
- 19 – TORX Socket Head Cap Screw
- 20 – SpiralTrac™ (optional)
- 21 – Gland O-Ring
- 22 – Eye Bolts (not shown)

* SpiralTrac is a trademark of EnviroSeal Engineering Products Limited.

3.0 DESCRIPTION cont.

3.1 Parts Identification

3.1.2 Bolted Gland Configuration



KEY

- 1 – Stationary Seal Ring
- 2 – Rotary Seal Ring
- 3 – Rotary Gasket
- 4 – Sleeve Assembly
- 5 – Lock Ring Assembly
- 6 – Pusher
- 7 – Gland
- 8 – Centering Clip
- 9 – Centering Clip Spacer
- 10 – Hex Screw
- 11 – Spring
- 12 – Shoulder Screw
- 13 – Washer
- 14 – Shaft O-Ring
- 15 – Rotary O-Ring
- 16 – Stationary O-Ring
- 17 – Pipe Plug
- 18 – Dog Point Set Screw
- 19 – TORX Socket Head Cap Screw
- 20 – SpiralTrac™ (optional)

3.0 DESCRIPTION cont.

3.2 Operating Parameters*

Pressure:

60 – 145 mm 250 psig (17 bar g)
180 – 220 mm 150 psig (8 bar g)

†Seal pressure capabilities are dependent on the fluid sealed, temperature, speed, and face combination.

Speed Limits:

60 – 145 mm – 20 m/s (4000 FPM)
180 – 220 mm – 12 m/s (2400 FPM)

Consult Seal Applications Engineering for higher applications.

Temperature Limits:**Elastomers**

To 150°C (300°F) EPDM
To 205°C (400°F) FEPM, FKM
To 260°C (500°F) FFKM

Standard Materials*

All Metal Parts: 316 SS / EN 1.4401
A2205 / EN 3.017
BRONZE

Springs: Alloy C276 / EN 2.4819

Rotary Face: SSC, TC

Stationary Face: SSC, TC

Elastomers: EPDM, FEPM, FKM, FFKM

**Other materials available upon request.*

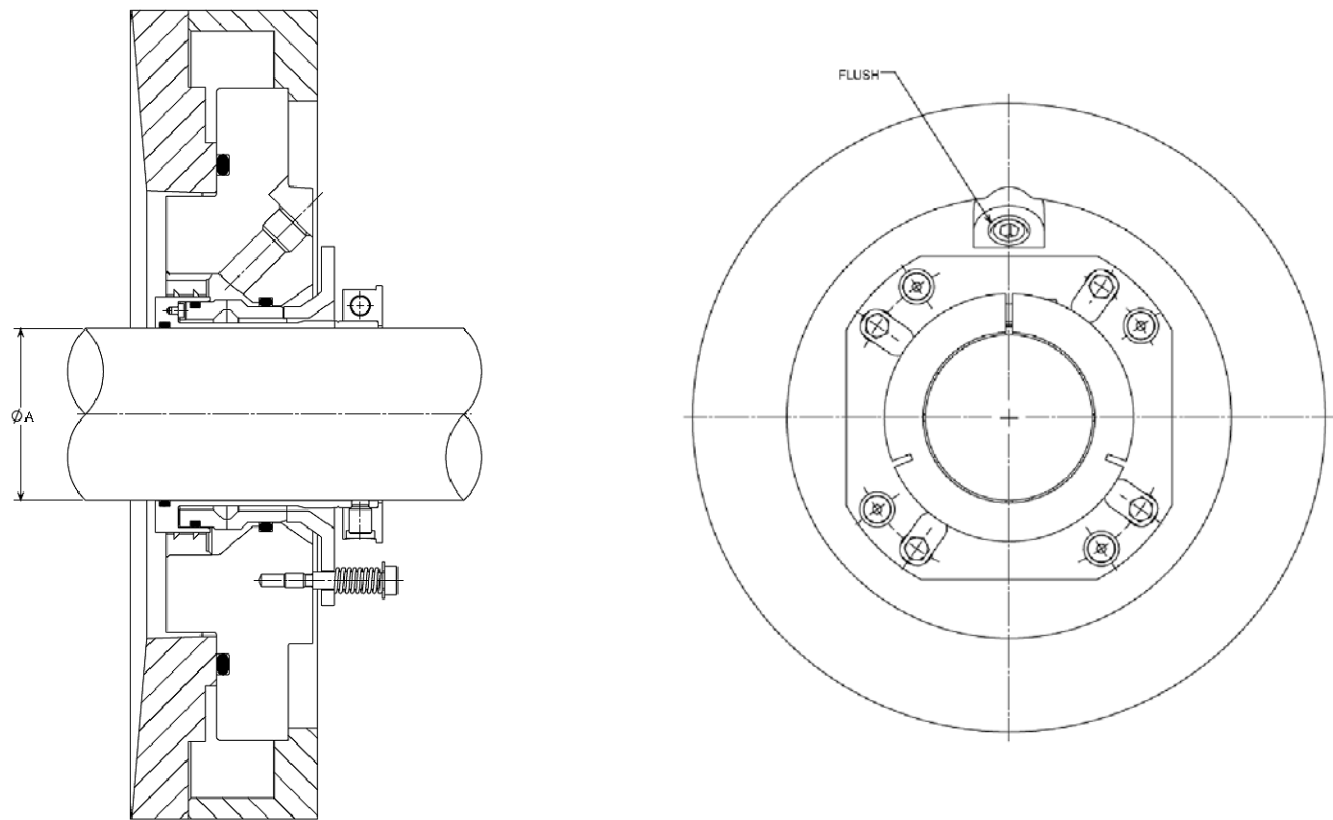
3.3 Intended Use

The mechanical seal is specifically designed for the intended application and is to be operated within the operating parameters as specified. For use beyond the intended application and/or outside the operating parameters, consult Chesterton to confirm the suitability of the mechanical seal prior to putting the mechanical seal in operation.

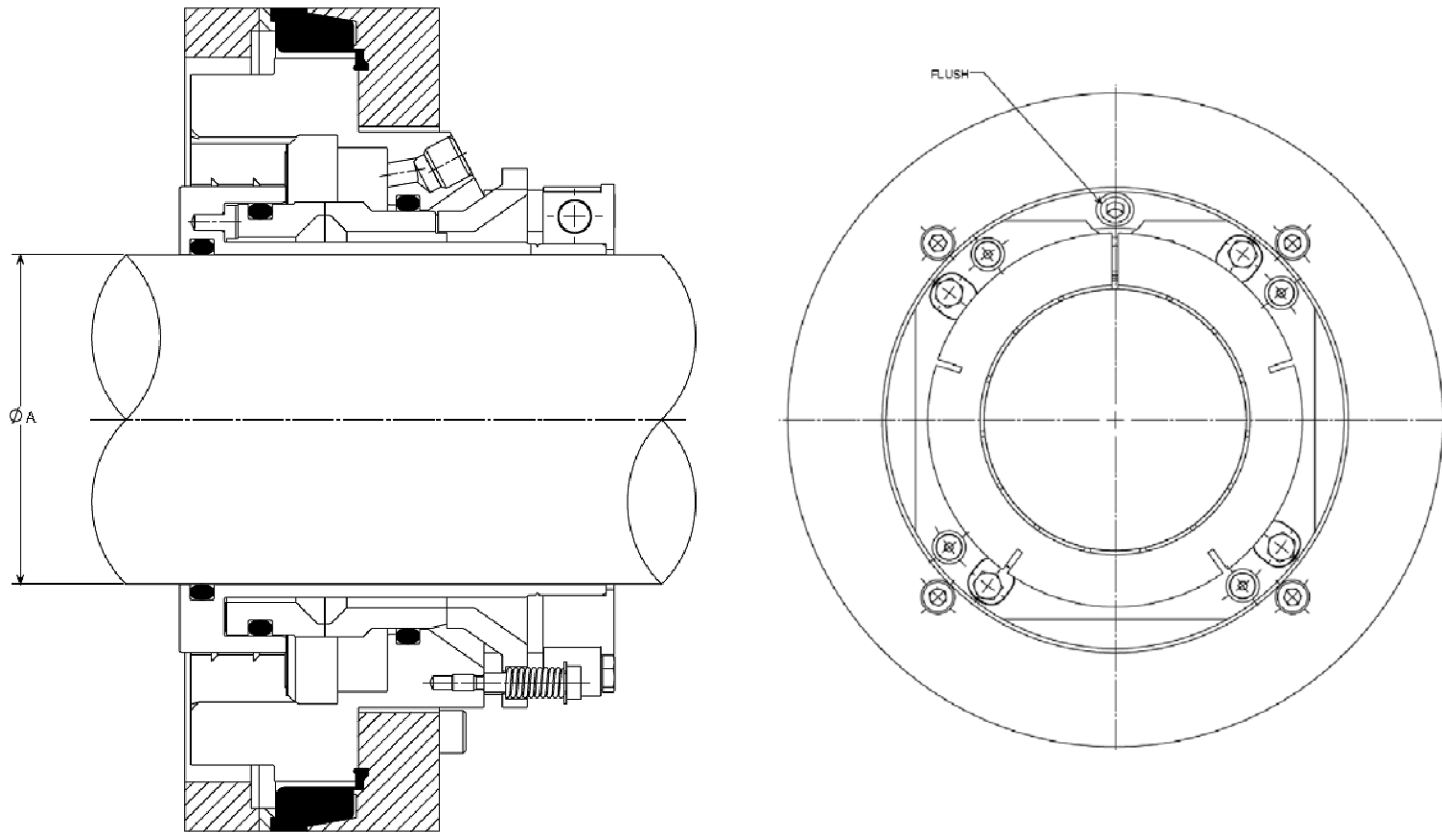
3.4 Pump Frame Size Availability Data

170L Slurry Seal Wet End - Seal Assembly Availability		
Weir Pump Model / Frame	Shaft Size (mm) A	Standard
1.5/1 B-AH 2/1.5 B-AH	50	✓
3/2 C-AH	60	✓
4/3 C-AH	60	✓
4/3 D-AH	85	✓
6/4 D-AH	85	✓
6/4 E-AH	100	✓
8/6 E-AH	100	✓
8/6 F-AH	130	✓
10/8 ST-AH	180	✓

3.5 Clamped Gland Configuration

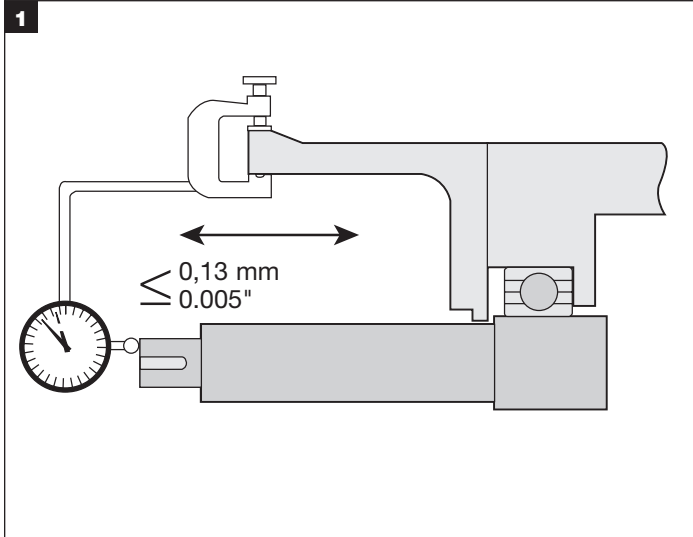


3.6 Bolted Gland Configuration

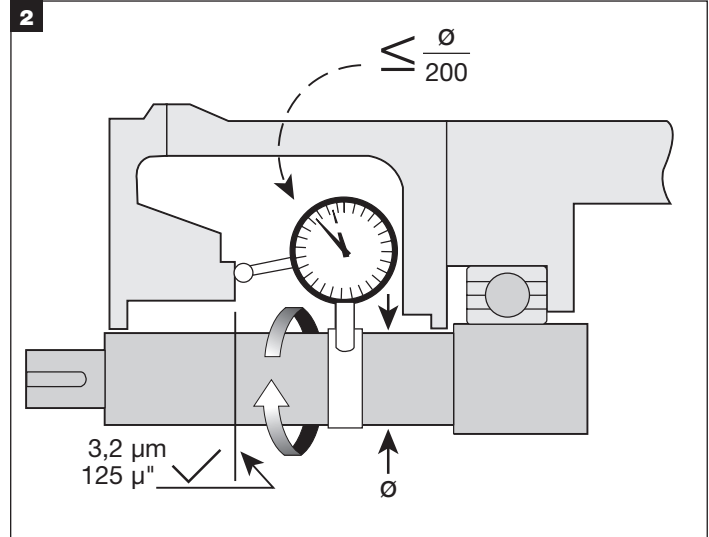


4.0 PREPARATION FOR INSTALLATION

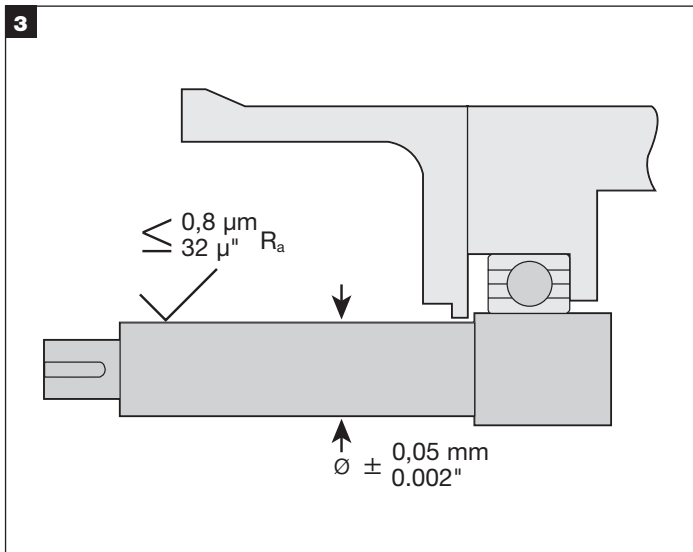
4.1 Equipment



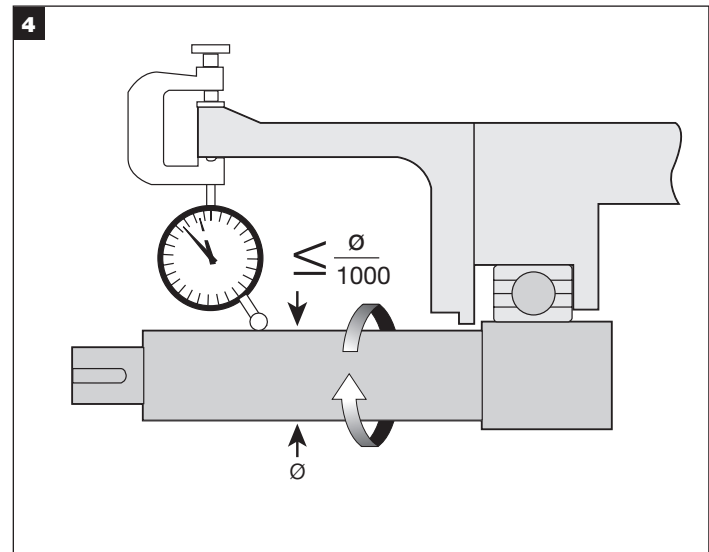
If practical, place the dial indicator tip on the end of the shaft sleeve or on a step in the shaft to measure end play. Alternately push and pull the shaft in the axial direction. If the bearings are in good condition, end play should not exceed 0,13 mm (.005").



If possible, attach a base dial indicator to the shaft and rotate both the indicator and shaft slowly while reading the runout of the stuffing box face. Misalignment of the stuffing box face relative to the shaft should not exceed 0,005 mm TIR per mm (.005 in per inch) of shaft diameter. The stuffing box face must be flat and smooth enough to seal the gland. Surface roughness should be 3,2 microns (125 microinch) Ra maximum for gaskets and 0,8 micron (32 microinch) Ra for O-Rings. Steps between halves of split case pumps should be machined flat. Make sure the stuffing box is clean and clear along its entire length.



Remove all sharp corners, burrs, and scratches on the shaft, especially in areas where the O-Ring will slide, and polish if necessary to achieve a 0,8 micron (32 microinch) Ra finish. Make sure the shaft or sleeve diameter is within 0,05 mm (.002") of nominal.



Use a dial indicator to measure the shaft runout in the area where the seal will be installed. Runout should not exceed 0,005 mm TIR per mm (.005 in per inch) of shaft diameter.

4.0 PREPARATION FOR INSTALLATION *cont.*

4.2 Mechanical Seal

1. **CAUTION:** The 1/4 dog point set screws go into the small holes in the sleeve. Do not disengage these screws from the sleeve when positioning the seal. Make sure all screws are engaged in the sleeve but do not protrude into the ID bore. Also, when repositioning or removing the seal, make sure the centering clips and socket head cap screws are engaged.
2. Centering clips have been preset at the factory. If for any reason you loosen or remove the centering clip cap screw, retighten as follows prior to installing the seal on the

equipment: Tighten the cap screw finger tight. Then using hex wrench, tighten cap screw an additional 1/8 turn. This will approximate the 3,4 Nm (30 inch-pounds) of torque for sizes 45 – 60 mm (1.75" – 2 1/2"), and 4,5 Nm (40 inch-pounds) of torque for 65 – 120 mm (2 5/8" – 4 3/4") set at the factory. For sizes 25 – 43 mm (1" – 1.625") tighten the button head screws to 2,3 Nm (20 inch-pounds) of torque.

3. Tools required for installation:

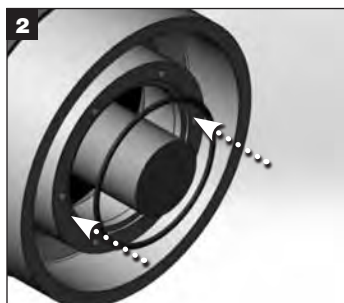
- Hex keys (provided with Seal)
- Open-end or adjustable wrench (provided by customer)

5.0 SEAL INSTALLATION

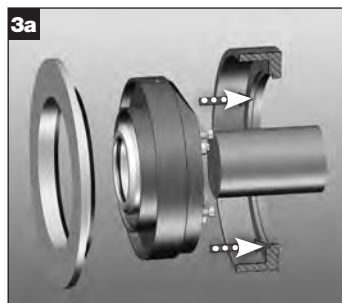


Remove seal from packaging and place on clean work surface.

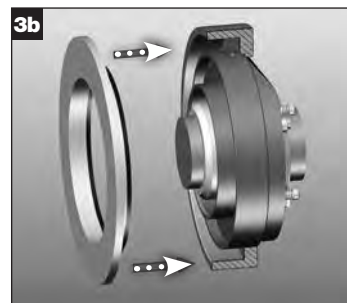
IMPORTANT: Remove eye bolts (if present) prior to installation.



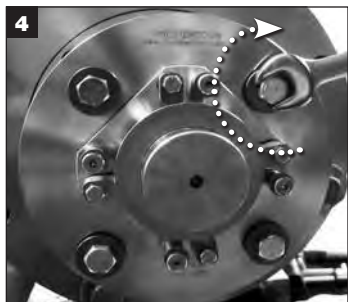
Install Gland O-Ring into equipment prior to seal installation.



Apply a thin film of grease (provided with seal) on the shaft. Slide seal onto the shaft.



Reinstall Frame plate (customer supplied).

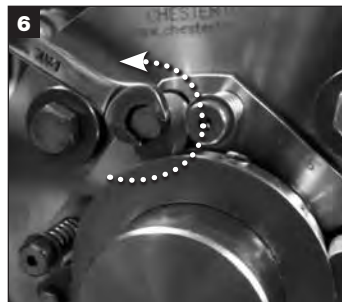


Tighten gland bolts as specified in Table 1 (page 8).

Only applicable for bolted gland configuration 85mm – 180mm



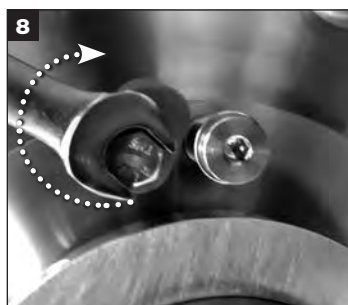
Tighten lock ring bolt as specified in Table 1. Reassemble the equipment. Make all necessary equipment and impeller adjustments.



Loosen the hex head cap screws attached to the centering clips.



Turn the clips 180° from their original position.



Retighten the cap screws (to hold clips in place).

Gland Socket Head Screws Information

Weir Pump Model / Frame	Shaft Size (mm) A	Bolt Size	Count
1.5/1 B-AH	50	–	–
2/1.5 B-AH	50	–	–
3/2 C-AH	60	–	–
4/3 C-AH	60	–	–
4/3 D-AH	85	–	–
6/4 D-AH	85	M12 X 1.75	4
6/4 E-AH	100	M8 X 1.25	4
8/6 E-AH	100	M12 X 1.75	8
8/6 F-AH	130	M10 X 1.5	8
10/8 ST-AH	180	M12 X 1.75	8

5.0 SEAL INSTALLATION cont.

Table 1

Shaft Size	Torque Value (ft-lb)		Torque Value (N-m)	
	Gland Bolts	Lock Ring	Gland Bolts	Lock Ring
50 mm	20 – 30	6 – 8	27 – 40	8 – 11
60 mm	20 – 30	6 – 8	27 – 40	8 – 11
85 mm	25 – 35	14 – 16	34 – 48	19 – 22
100 mm	25 – 35	28 – 30	34 – 48	38 – 41
130 mm	40 – 60	28 – 30	54 – 81	38 – 41
180 mm	40 – 60	28 – 30	54 – 81	38 – 41

5.1 SpiralTrac™ Option Installation

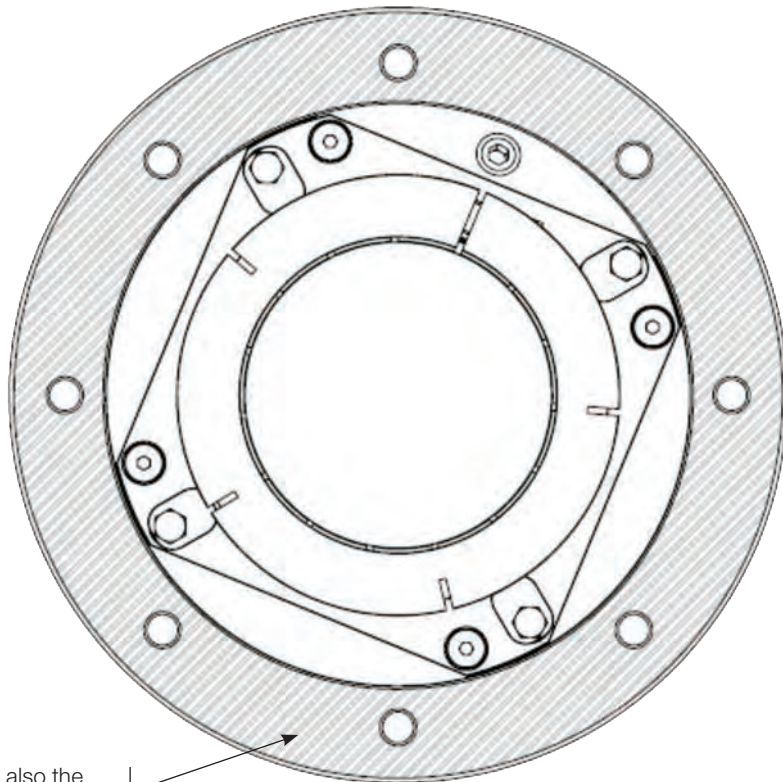
Tools/Equipment required for installation:

- Gland supports of sufficient height to raise lock ring assembly above seal support plate (see SpiralTrac™ installation step 3).
- Arbor press
- Press support plates

CAUTION: Gland support areas as shown.

Grease fittings* may affect available support area. Grease fittings shown in this image do not affect support area.

**Available on Quench and Drain Configuration ONLY*

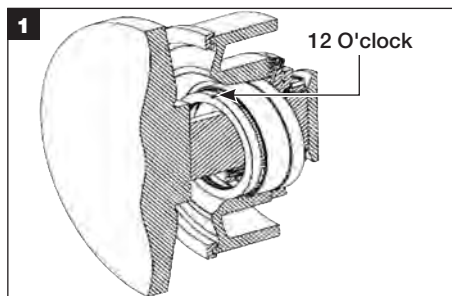


This surface is a sealing surface, it's also the Gland support area for installing the SpiralTrac™.

CAUTION: Gland supports must not scratch or damage this surface.

* SpiralTrac is a trademark of EnviroSeal Engineering Products Limited.

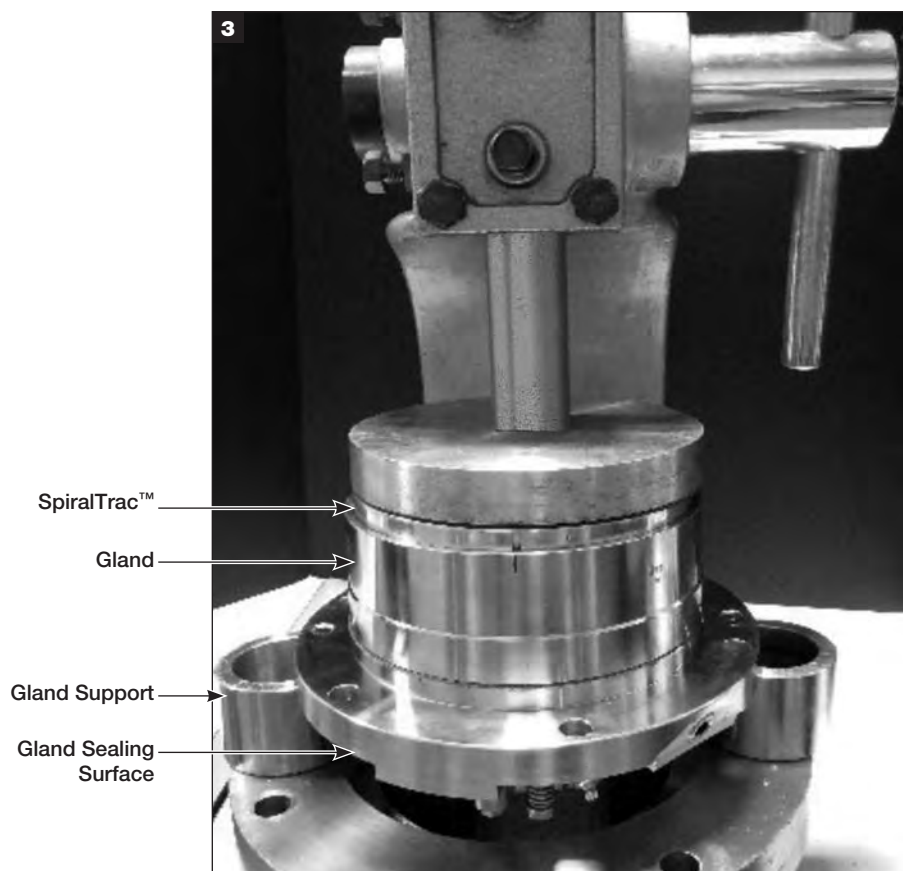
5.0 SEAL INSTALLATION cont.



Scribe a mark on the seal adapter's outer surface indicating the seal's 12 o'clock (vertical) location when mounted on the equipment.



Place the SpiralTrac™ with the flat side facing out and the vent aligned with the 12 o'clock scribe mark on the adapter.



Center the seal on the gland supports in the press, place pressing plate flush with the SpiralTrac™.



Press with an even force until the SpiralTrac™ is flush with the seal gland.

6.0 COMMISSIONING / EQUIPMENT START-UP

1. Attach appropriate plumbing/environmental controls to the seal.
2. Take all necessary precautions and follow normal safety procedures before starting the equipment.

Please contact Chesterton Mechanical Seal Application Engineering for assistance regarding the 170L seal.

7.0 DECOMMISSIONING / EQUIPMENT SHUT DOWN

Ensure that the equipment is electrically isolated. If the equipment has been used on toxic or hazardous fluids, ensure that the equipment is correctly decontaminated and made safe prior to commencing work. Ensure that the pump is isolated and check that the stuffing box is drained from any fluid and pressure is fully released. Reposition centering clips prior to

removing the seal from equipment. Disassemble the seal and remove from equipment in the reverse order from installation instructions. In case of disposal, ensure the local regulations and requirements for disposal or recycling of the different components in the seal are adhered to.

8.0 SPARE PARTS

Use only Chesterton original spare parts. Use of non-original spare parts represents risk of failure, danger to persons/equipment and voids the product warranty.

Spare Parts Kits can be purchased from Chesterton, referencing the recorded seal data from cover page.

9.0 SEAL MAINTENANCE AND REPAIR

9.1 Returning Seals for Repair and Hazard Communication Requirements

Any mechanical seal returned to Chesterton that has been in operation, must comply with our Hazard Communication requirements. Please go to our web page at **chesterton.com/Mechanical_Seal>Returns** to obtain information required for returning seals for repair or seal analysis.

9.2 Seal Maintenance

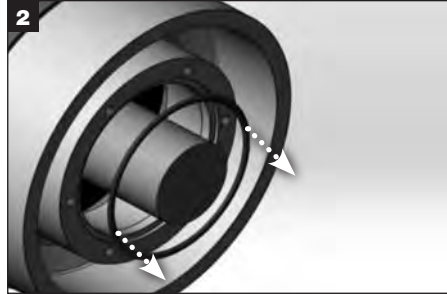
A correctly installed and operated mechanical seal requires little maintenance. It is recommended to periodically check the seal for leakage. Wearing components of a mechanical seal such as seal faces, O-Ring, etc., require replacement over time. While a seal is installed and operating, maintenance is not possible.

Therefore it is recommended that a spare seal unit or a spare parts kit be held in stock to allow quick repair.

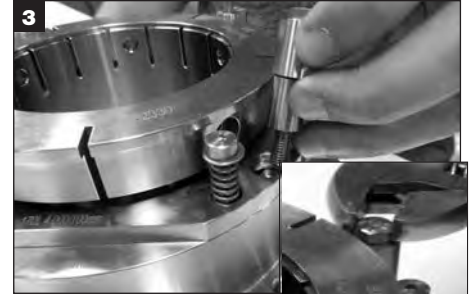
1. The following items, in addition to hex wrenches, grease and cleaning wipes, will be required for rebuild:
 - Adjustable wrench
 - Flat ruler or straight edge
2. Note the condition of the parts, including elastomer surfaces and gland springs. Analyze the cause of failure and correct the problem, if possible, before reinstalling the seal.
3. Clean all elastomer and gasket surfaces with cleaning solvent.



Prepare a clean work surface for seal disassembly and rebuild.



Remove face gasket O-Ring (not all sizes) discard.



Disengage centering clips and remove screws, clips, and bushings from pusher and discard.



Remove dog point set screws and TORX screw from lock ring and discard.



Remove lock ring from sleeve.



Separate gland assembly from sleeve assembly.



Invert gland assembly and remove stationary seal ring and discard.



Remove old pipe plug if it is still installed and discard.



Invert gland assembly. Remove shoulder screws and discard. Lift pusher from gland assembly.



Remove O-Ring from gland inside diameter and discard.



Remove rotary seal ring from sleeve and discard.



Remove shaft O-Ring from sleeve inside diameter and discard.



Clean all metal components with approved solvent.



Remove spare parts kit components from packaging and place on a clean work surface.
NOTE: Leave the two largest O-Rings packaged for size identification.



Place the rotary seal face on a dry clean cloth face side down to avoid scratching or damaging the face. Peel the adhesive backing from the rotary cushions. Align scored edges with edges of slots and press to ensure adhesion to that surface.



Fold the cushion tabs into the slots and press them in against the drive slot edge with a straight edged tool or ruler.



Apply a thin film of grease to the rotary O-Ring and install in the rotary seal face outside diameter groove



Apply a thin film of grease to the shaft O-Ring and install in the sleeve inside diameter groove.

9.0 SEAL MAINTENANCE AND REPAIR cont.



Slide rotary seal face onto sleeve. Align drive slots with drive lugs in sleeve and press evenly on the face to ensure proper spacing and that the seal face is seated. Wipe the seal face surface with a clean soft cloth.



Apply a thin film of the grease supplied to the gland O-Ring and install in the gland inside diameter groove.



Align through holes in pusher with threaded holes in gland. **NOTE** (not applicable for all sizes): Align scalloped edge of pusher with NPT flush port in gland as shown in inset.



Install bushings in 4 large through holes.



Insert hex head screws into centering clips; insert into the bushings and tighten finger-tight.



Insert shoulder screws with washers into springs and install in pusher holes. Tighten shoulder screws evenly in a crisscross pattern and until they bottom out.



Wrap threads of pipe plug 1 1/2 wraps with Chesterton GoldEnd™ tape (or equivalent) Insert pipe plugs (2X) into gland and tighten to recommended torque value.



Flip the gland and Insert the stationary seal face into the gland (as shown), carefully aligning the drive slots with the lugs in the gland. Press evenly on the face to ensure that the seal face is fully seated. Clean the face surface with a clean cloth.

9.0 SEAL MAINTENANCE AND REPAIR *cont.*



Flip the gland assembly and carefully slide the gland over the sleeve until the seal faces are mated.



Install dog point and TORX screws into lock ring.



Slide the lock ring over the sleeve. Align dog point screw holes in the lock ring with holes in the sleeve. Tighten dog point screws until flush with inside diameter of sleeve.



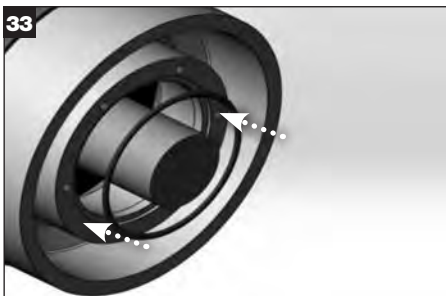
Press down on gland assembly and rotate centering clips to engage under the lock ring.



Tighten centering clip hex screws.



Install eye bolts for ease of transportation. **IMPORTANT:** Remove eye bolts prior to seal installation.



Install gland O-Ring prior to seal installation (does not apply to all sizes).



Seal is now ready for installation.



DISTRIBUTED BY:

Chesterton ISO certificates available on www.chesterton.com/corporate/iso

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FORM NO. EN36492 REV 5

5/23