

PREPARATION

CHESTERTON



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 rotating shaft 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 chemical listing is intended as a **general** reference for this seal **only**. The decision to use this seal or any other Chesterton seal in a particular service is the customer's responsibility.

SEAL INSTALLATION

 Check the chemical listing to determine if the Viton* O-rings installed in this seal are compatible with the fluid being sealed. If it is necessary to change the O-ring material, disassemble the seal as shown in the instructions and replace it with suitable O-rings. A spare set of Ethylene Propylene O-rings is supplied with the seal.

* Registered Trademark of DuPont.

- 2. The 1/4 dog point set screws engage the smaller holes in the sleeve. Do not disengage the 1/4 dog point set screws from the sleeve when positioning the seal. The cup point set screws engage the larger holes in the sleeve. Make sure the 1/4 dog and cup point set screws are engaged into the sleeve but do not protrude into the l.D. bore. Additionally, when repositioning or removing the seal make sure the three centering clips and socket head cap screws are engaged.
- 3. The 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 your equipment. Tighten the cap screw finger tight, then using the hex wrench, tighten the cap screw an additional 1/8 of a turn. This will approximate the 30 in-lbs (3,4 N.m) of torque set at the factory. Make sure that the centering clips are all bottomed out on the retainer.
- 4. The 225 seal has alloy steel cup point set screws installed in the lock ring. If additional corrosion resistance of these screws is required, they may be replaced with the stainless steel cup point set screws provided, if the stuffing box and/or barrier fluid pressures are not above 300 psig (20 Bar).
- 5. Slide the seal onto the shaft, making sure the 1/4 dog point set screws are engaged through the seal sleeve.
- Reassemble the pump and make necessary shaft and impeller adjustments. The impeller can be reset at any time, as long as the centering clips are in place and the seal set screws are loosened while the shaft is being moved.
- Orientate the barrier fluid connections to the location required. *Piping* connections should not be made prior to tightening the gland bolts.
- 8. Tighten the gland nuts evenly. IMPORTANT: The gland nuts must be tightened before tightening the set screws onto the shaft.

- Evenly tighten all set screws (cup point set screws and 1/4 dog point set screws) with the hex wrench provided. After they have been tightened with the hex wrench, tighten them again with a torque wrench to 50-60 in-lbs (5,7-6,8 N.m).
- 10. Remove the centering clips and retain them for later use.
- 11. Check the spring gap, between the pusher and lock ring. An equal gap all around is indicative of the correct axial positioning and squareness of the stuffing box to the shaft.

The gap should be: .06" (1,6 mm) for -8 through -20, 25 mm through 60 mm; .09" (2,2 mm) for -21 through -38, 65 mm through 120 mm

12. IMPORTANT:

It is important to make sure that the gland is properly centered over the sleeve. To do this, turn the shaft by hand to make sure the seal turns freely. If you hear metal to metal contact within the seal, it is improperly centered.

Replace the centering clips finger tight, loosen the gland bolts, tighten the clips, re-tighten gland bolts, and then remove the clips.

If metal to metal contact still exists check the centering of the stuffing box.

13. Piping connections should not be made until the gland nuts are tightened.

14. BARRIER FLUID PIPING CONNECTIONS:

The barrier fluid ports are: 3/8" NPT for sizes 1.000" - 1.625", 25 mm -43 mm; 1/2" NPT for sizes 1.750" -4.75", 45 mm - 120 mm

The seal is equipped with a pumping device to circulate the barrier fluid as well as a vent port for the outboard faces. The vent connection, located 180 degrees from the two barrier fluid ports can be used as the cool fluid return line to the seal. *The Piping Connections are Dependent on Shaft Rotation.*

CONVECTION

A. CLOCKWISE shaft rotation

When looking at the lock ring end of the seal:

• The cool fluid from the bottom of the barrier fluid tank enters the seal through the right port or the vent.

• The hot fluid exits the seal through the left port and connects to the top of the barrier fluid tank.

B. COUNTER-CLOCKWISE shaft rotation

When looking at the lock ring end of the seal:

• The cool fluid from the bottom of the barrier fluid tank enters the seal through the left port or the vent.

• The hot fluid exits the seal through the right port and goes to the top of the barrier fluid tank.

Add a compatible fluid, typically 50/50 ethylene glycol and water or AWC 610 Synthetic Lubricating Oil, to the barrier fluid tank.

NOTE: For further details, consult the Chesterton barrier fluid tank installation instructions.

FORCED CIRCULATION

A. CLOCKWISE shaft rotation

When looking at the lock ring end of the seal:

• The cool fluid enters the seal through the right port or vent.

• The hot fluid exits the seal through the left port.

B. COUNTER-CLOCKWISE shaft rotation

When looking at the lock ring end of the seal:

• The cool fluid enters the seal through the left port or vent.

• The hot fluid exits the seal through the right port.

For a double sealing arrangement, the barrier fluid is typically pressurized at approx. 15-20 psi (1-1,5 Bar) above the stuffing box pressure.

For a tandem sealing arrangement, the barrier fluid is typically pressurized between 15 psi (1-1,5 Bar) and half of the stuffing box pressure.

The barrier fluid pressure must never exceed the stuffing box pressure by more than 250 psi (17,0 bar)

Take all necessary precautions and follow normal safety procedures before starting equipment.

DISASSEMBLY (1-9)



You will need the hex keys provided with the seal and an O-ring extractor or paper clip to disassemble the seal.



Place the seal lock ring side up on a flat surface. Remove the centering clips. While pressing down on the lock ring, back off all the set screws until they disengage from the sleeve. Lift the lock ring off the sleeve and remove all the screws.



Lift the gland off the sleeve and remove the outboard stationary and the O-ring.



Turn the gland over and remove the button head cap screws, the retainer and the pusher. Remove the springs from the retainer.



Remove the outboard rotary and collar as one unit from the sleeve. If necessary pull the nose assembly towards the collar, this will help the collar break free of the sleeve. NOTE: The outboard rotary has pumping vanes which differentiates it from the inboard rotary.



Separate the rotary from the collar and remove the O-ring.



Remove the loose O-ring and back-up washer from the sleeve.



Slide the adapter, nose, stationary drive and stationary unit off the sleeve and separate all the components. Remove the springs from the stationary drive and the two O-rings from the nose.



Carefully remove the inboard rotary from the sleeve, being sure the slots in the rotary align with the outboard drive of the sleeve. Remove the shaft and rotary O-rings from the sleeve.

Refer to the chemical listing to determine the chemical compatibility of the elastomers with the fluid being sealed. The 225 seal is supplied with Viton* O-rings installed. If necessary, replace the Viton* with the Ethylene Propylene provided. If Viton* and Ethylene Propylene are not compatible, you may obtain Buna-N, Neoprene, Chesterton Style 76, Chemraz**, or Kalrez* elastomers from your Chesterton distributor.

ASSEMBLY (10-25)

Apply silicone grease provided to all O-rings.



Place the sleeve ID and OD O-rings in their grooves. Slide the inboard rotary onto the sleeve, lining up the drive tabs with the rotary slots, until it bottoms out.



Place a spring in each spring hole in the retainer and the stationary drive applying a small amount of silicone grease to the bottom of each spring. This will help the springs stay in the holes.



Place the gland outboard side up (side with the barrier fluid markings) on a flat surface. Slide the pusher into the gland. Then place the retainer in the gland, engaging the retainer anti-rotation pins in the pusher slots.



Install the button head socket screws in the gland, alternately tightening them until the retainer is fixed in place.



Slide the outboard stationary O-ring onto the stationary.



Place the gland inboard side up on a flat surface. Slide the outboard stationary into the gland until the pusher anti-rotation lugs engage the stationary slots.



Place the inboard stationary O-ring and the nose to gland O-ring in the nose. Slide the inboard stationary into the nose.



Wipe the inboard rotary and stationary faces with a clean lint-free cloth. Place the sleeve lock ring end up on a flat surface. Slide the stationary/nose assembly onto the sleeve until the rotary and stationary contact.

ASSEMBLY (10-25)



Slide the stationary drive over the sleeve until it engages its anti-rotation lugs in the stationary slots.



Slide the adapter over the sleeve until it pilots in the nose and engages its antirotation pins with the slots in the stationary drive.



Slide the back-up washer over the sleeve, pressing the rotary drive tabs inward if necessary, until it bottoms on the middle set of tabs on the sleeve. Slide the collar ID O-ring up against the back-up washer, again pressing the drive tabs inward if necessary.



Place the collar OD O-ring in the collar. Press the outboard rotary onto the collar until it bottoms out.



Carefully slide the collar/rotary assembly onto the sleeve, aligning the drive tabs with the rotary slots, until it bottoms out on the back-up washer and engages the outboard rotary drive tabs.



Wipe the outboard rotary and stationary faces with a clean lint-free cloth. Slide the gland over the sleeve until the nose and adapter bottom-out inside the gland pilot.



Install the screws in the lock ring as follows: Install the 1/4 dog point set screws in the large holes that line-up with the small holes in the sleeve. Install the cup point set screws in the large holes that line-up with the large holes in the sleeve.

Place the lock ring on the sleeve and engage all of the set screws in the sleeve making sure the screws do not protrude past the ID of the sleeve or deform the sleeve.



While pressing down on the gland install the centering clips using the socket head cap screws to secure them to the lock ring. Tighten the cap screws finger tight, then using the hex head wrench tighten them an additional 1/8 of a turn. Make sure the centering clips all bottom out evenly on the retainer.

Turn the seal over and install the gland to stuffing box gasket in the gasket groove. The assembly is now complete.





DIMENSIONAL DATA (INCH)

							G MIN BY BOLT SIZE									
SHAFT	BOX BORE			-								C	D-RINGS			
SIZE	В	С	С	D	E	F										
Α	MAX	MIN	MAX	MAX	MIN	MAX	3/8"	1/2"	5/8"	3/4"	V	W	X	Y	Z	н
1.000	4.11	1.75	2.00	1.73	1.92	2.13	2.86	2.98			120	124	126	121	136	.57
1.125	4.11	1.88	2.13	1.85	1.92	2.13	2.98	3.11			122	126	128	124	137	.57
1.250	4.11	2.00	2.25	1.98	1.92	2.13	3.11	3.23			124	128	130	126	141	.57
1.375	4.36	2.13	2.38	2.10	1.92	2.13	3.23	3.36			126	130	132	128	143	.57
1.500	4.49	2.25	2.50	2.23	1.92	2.13	3.36	3.48			128	132	134	130	145	.57
1.625	4.99	2.38	2.50	2.35	1.92	2.13	3.48	3.61			130	134	136	132	147	.57
1.750	5.49	2.50	2.63	2.48	1.92	2.13	3.62	3.75			132	136	138	134	149	.57
1.875	5.49	2.63	2.75	2.60	1.92	2.13	3.75	3.87			134	138	140	136	150	.57
2.000	5.49	2.75	2.88	2.73	1.92	2.13	4.00	4.12			136	140	142	138	152	.57
2.125	5.99	2.88	3.00	2.85	1.92	2.13	4.25	4.37	4.50		138	142	144	140	153	.69
2.250	5.99	3.00	3.13	2.98	1.92	2.13	4.37	4.50	4.62		140	144	146	142	153	.69
2.375	5.99	3.13	3.25	3.10	1.92	2.13	4.41	4.55	4.67		142	146	148	144	153	.69
2.500	6.49	3.25	3.38	3.23	1.92	2.13	4.63	4.75	4.87		144	148	150	146	154	.69
2.625	6.45	3.63	3.89	3.60	2.48	2.75		5.37	5.50		231	234	236	232	243	.68
2.750	7.71	3.75	4.19	3.73	2.48	2.75		5.50	5.62		232	235	237	233	245	.68
2.875	7.83	3.88	4.32	3.85	2.48	2.75		5.62	5.75		233	236	238	234	246	.68
3.000	7.94	4.00	4.44	3.98	2.48	2.75		5.75	5.87		234	237	239	235	247	.68
3.125	7.99	4.13	4.57	4.10	2.48	2.75		5.87	6.00		235	238	240	236	248	.68
3.250	8.19	4.25	4.69	4.23	2.48	2.75		6.00	6.12		236	239	241	237	249	.68
3.375	8.31	4.38	4.82	4.35	2.48	2.75		6.12	6.25	6.37	237	240	242	238	250	.82
3.500	8.44	4.50	4.94	4.48	2.48	2.75		6.25	6.37	6.50	238	241	243	239	251	.82
3.625	8.50	4.63	5.07	4.60	2.48	2.75		6.37	6.50	6.62	239	242	244	240	252	.82
3.750	8.72	4.75	5.19	4.73	2.48	2.75		6.50	6.62	6.75	240	243	245	241	253	.82
3.875	8.40	4.88	5.32	4.85	2.48	2.75		6.62	6.75	6.87	241	244	246	242	254	.82
4.000	8.96	5.00	5.44	4.98	2.48	2.75		6.75	6.87	7.00	242	245	247	243	255	.82
4.125	8.99	5.13	5.57	5.10	2.48	2.75		6.87	7.00	7.12	243	246	248	244	256	.82
4.250	8.99	5.25	5.69	5.23	2.48	2.75		7.00	7.12	7.25	244	247	249	245	257	.82
4.375	9.34	5.38	5.82	5.35	2.48	2.75		7.12	7.25	7.37	245	248	250	246	258	.82
4.500	9.49	5.50	5.94	5.48	2.48	2.75		7.25	7.37	7.50	246	249	251	247	258	.82
4.625	9.49	5.63	6.07	5.60	2.48	2.75		7.37	7.50	7.62	247	250	252	248	259	.82
4.750	10.49	5.75	6.19	5.73	2.48	2.75		7.50	7.62	7.75	248	251	253	249	259	.82

DIMENSIONAL DATA (METRIC)

	STUFFING BOX BORE					G MIN BY BOLT SIZE										
SHAFT		•	•		-	-	-									
A	MAX	MIN	MAX	MAX	MIN	MAX	10 mm	12 mm	16 mm	20 mm	v	w	x	Y	z	н
25	104	44	50	43	49	54	73	75			120	124	126	121	136	14
28	104	47	53	46	49	54	76	78			122	126	128	123	137	14
30	104	49	55	48	49	54	77	79			123	127	129	125	140	14
32	104	51	57	50	49	54	79	81			124	128	131	126	141	14
33	113	52	58	51	49	54	80	82			125	129	131	127	142	14
35	111	54	60	53	49	54	82	84			126	130	132	128	143	14
38	114	57	63	56	49	54	85	87			128	132	134	130	145	14
40	127	59	62	58	49	54	87	89			129	134	136	131	146	14
43	127	62	65	61	49	54	90	92			131	136	138	133	148	14
45	139	64	67	63	49	54	92	94			133	137	139	134	149	14
48	139	67	70	66	49	54	95	97			134	139	141	136	150	14
50	139	69	72	68	49	54	97	99			136	140	142	137	151	14
55	152	74	77	73	49	54	102	104	108		139	143	145	140	151	17
60	152	79	82	78	49	54	112	114	118		142	146	148	144	153	17
65	164	92	99	91	63	70		135	139		231	234	236	232	243	17
70	196	95	106	95	63	70		139	143		232	235	237	233	245	17
75	202	102	113	101	63	70		145	149		234	237	239	235	247	17
80	203	105	116	105	63	70		149	153		235	239	240	237	248	17
85	211	111	122	110	63	70		155	159	162	237	240	242	238	250	21
90	214	115	125	115	63	70		159	163	167	238	242	243	240	251	21
95	221	121	132	120	63	70		164	168	172	240	243	245	241	253	21
100	228	127	138	126	63	70		171	175	179	242	245	247	243	255	21
110	237	137	148	136	63	70		180	184	188	245	248	250	246	258	21
120	266	146	157	145	63	70		190	194	198	248	251	253	249	259	21



225 is a trademark of A.W. Chesterton Company.



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