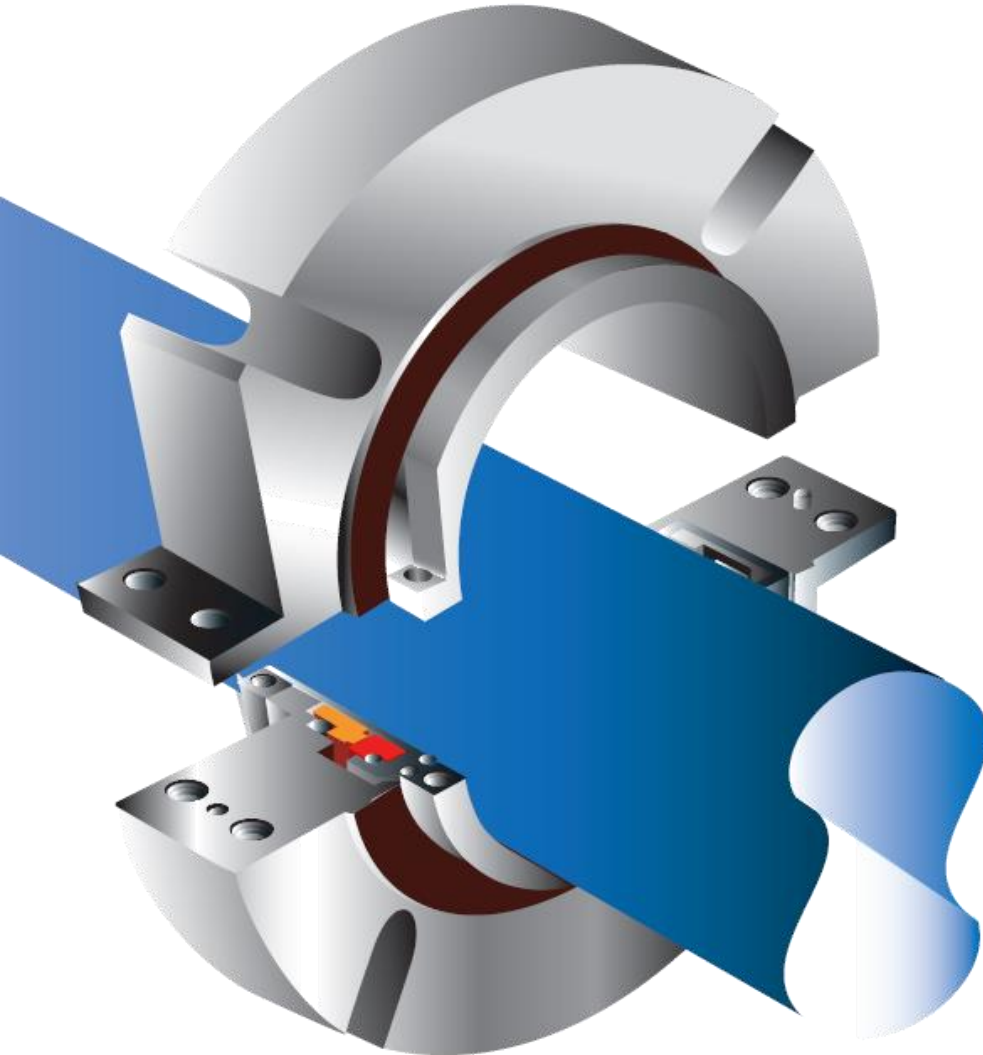




**Flex-A-Seal**



## Style 85

World's Only  
Split Cartridge  
Seal



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years



# Brief History



- Established in 1983 by Hank Slauson in Vermont, USA – Owner and President
- Chief Engineer Kim Simmons joins FAS in 1986; previous work experience with EG&G Sealol and Flexibox
- Opened a second branch in Sao Paulo, Brazil in 1996

As of today, we:

- offer a multitude of seal lines (API 682 compliant double and single, High Temp., Split & ANSI cartridge seals, welded metal bellows, component seals, lube systems.)
- number of employees has grown for past five years, including State Award
- supply 500+ distributors, resellers and selective OEM's in 30+ countries





## Our Mechanical Seal Product Line

- Split Cartridge: Patent 5662340
- Integrated Single Cartridges
  - Double Cartridges
- Industry Leading High Temp Metal Bellows Cartridge
- Component Seals
- OEM Specific Seal Designs: Cryogenic, Sundyne, etc.
- Hermetic Bellows





**Flex-A-Seal**



# History of the Split Seal

- Split seals were first used on nuclear submarine main propeller shafts in 1954. They were as reliable as conventional solid seals, but very expensive due to the technology at the time
- O-Rings used to be glued, creating a "hard spot" that'll prevent proper sealing
- Glued elastomers are never acceptable as a dynamic elastomer
- Early split seals would have to be heavily re-machined to return to concentricity after being cut in half with a saw.
- The use of EDM to split manufactured parts makes for a more streamlined process



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





**Flex-A-Seal**



# Why a Split Seal?

Difficult/Time consuming installs: **SOLVED**

Pump & Equipment disassembly: **NOT REQUIRED**

**LESS DOWNTIME** when replacing seals equals **CO\$T \$AVING\$**



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





**Flex-A-Seal**



# Why a Split Seal?

Chemical Processing  
Food Processing  
Industrial  
Mining  
Pharmaceutical  
Power Generation  
Petrochemical  
Pulp and Paper  
Refining Water Pump  
Water and Waste Treatment  
Pumps  
Mixers  
Agitators



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





## Why a Split Seal?

**Leaking Pump:** Break or cut off the present solid gland and seal and install a split seal. The pump can be back on stream quickly without disassembly of equipment.

**Mixers and awkward locations:** Very costly equipment disassembly avoided

**Vertical and horizontal split case pumps:** Very costly equipment disassembly avoided

**Dangerous install:** Short install times are important for safety

**Damaged Sleeve:** From previous packing use. Split Seal doesn't sit on damaged area

**Expensive Leaking product:** Reduces leaking product when replacing packing





**Flex-A-Seal**



# Why a Split Seal?

## COST SAVINGS

**Equipment Downtime (Man Hours)**

**Seal Install Time Shortened (Man Hours)**

**Electricity Cost Savings when converting from packing to a Split Seal**

**Reduce amount of Leaking Product**

**Reduce amount of water used for a Seal**

**Factory based repair**



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years







# Flex-A-Seal



## Annual Packing Costs:

- + Packing
- + Shafts and Sleeves
- + Bearings
- + Lost Pumpage
- + Routine Maintenance
- + Packing Flush
- + Remove Flush from Product
- + Additional Power to Drive Packed Pump

\$ Total Sealing Expenditures



## Annual Mechanical Seal Costs:

- + New Seal

\$ Total Sealing Expenditures



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





**Flex-A-Seal**



**The easiest installation of any split seal in the world**

**Only split seal in the world in which just two pieces are handled: Faces can't be damaged from handling**



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years

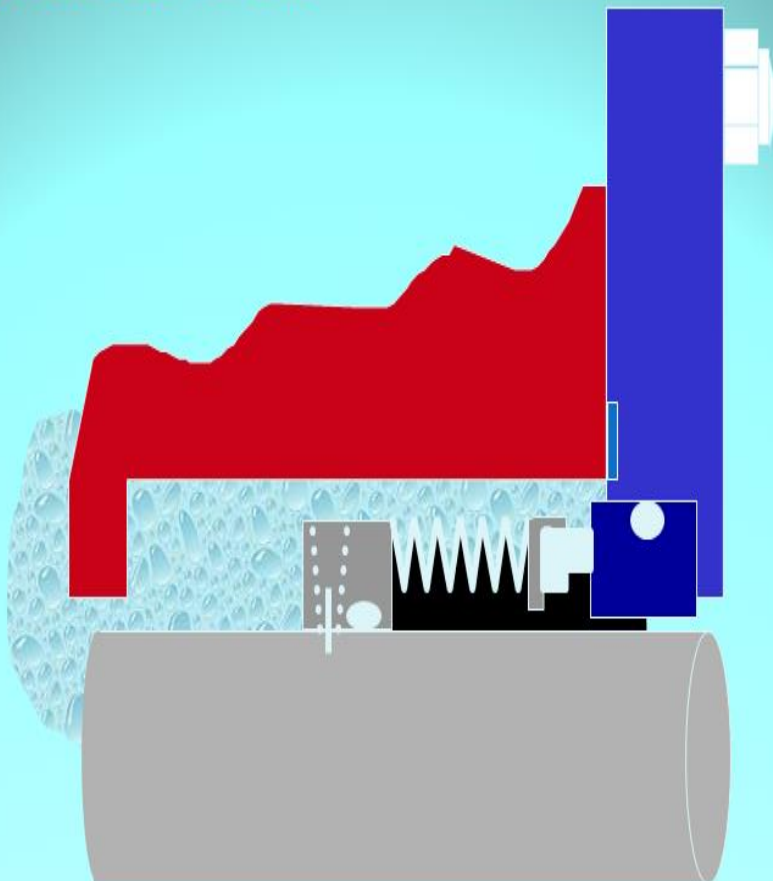




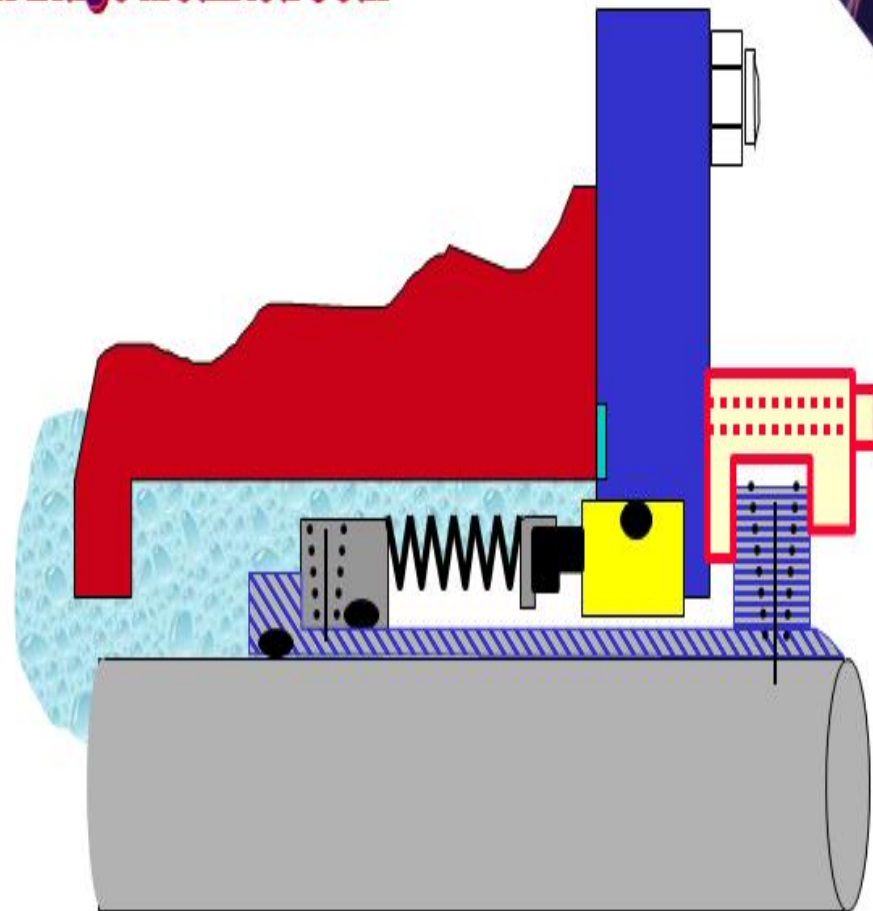
# Flex-A-Seal



## Component Seal



## Cartridge Mounted Seal



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



**Only split seal in which impeller can be adjusted without removing the seal**

**Only split seal that is fully assembled and pressure tested at the factory**



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



**No measurements.  
No special tools.**

**No shims.  
No glue.**

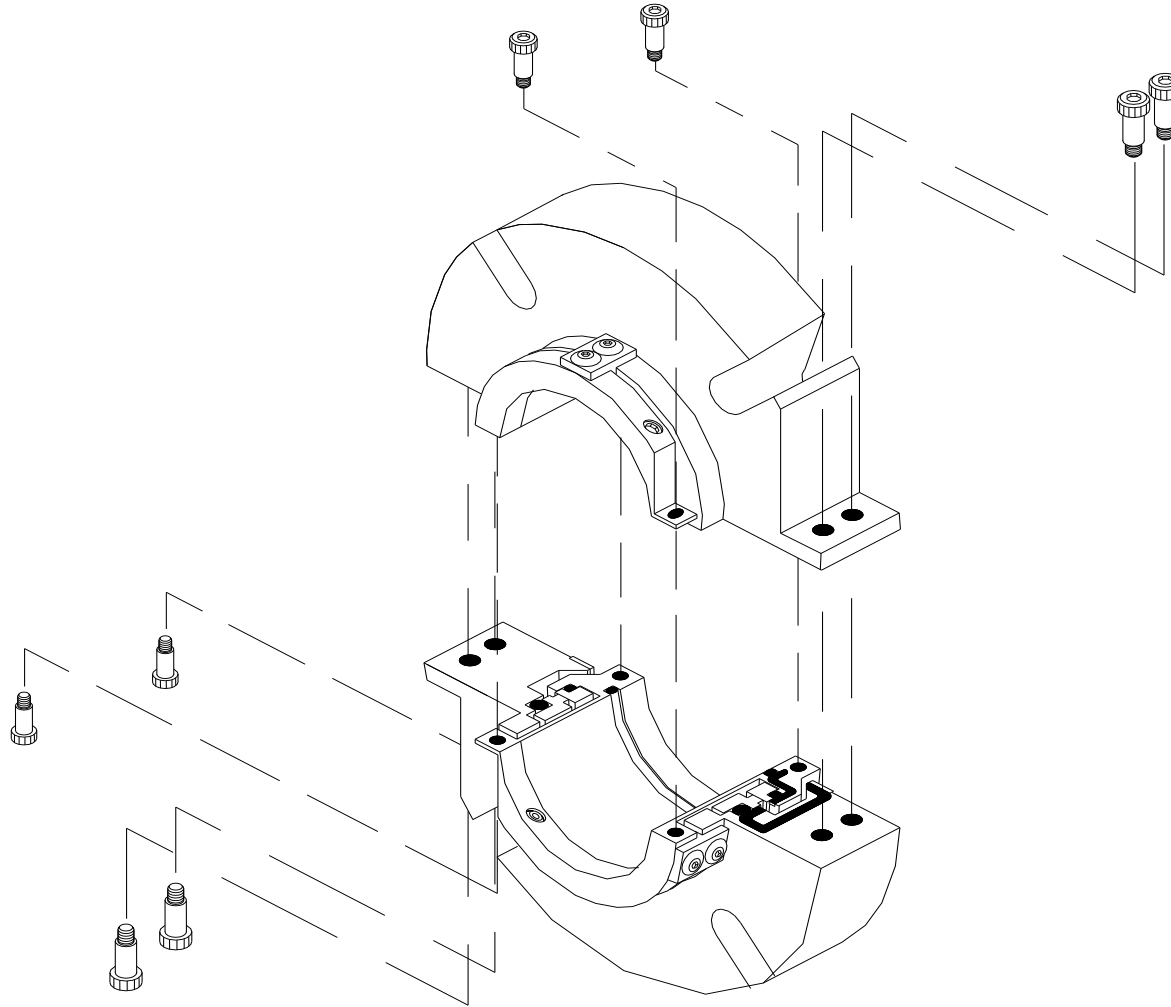


Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years

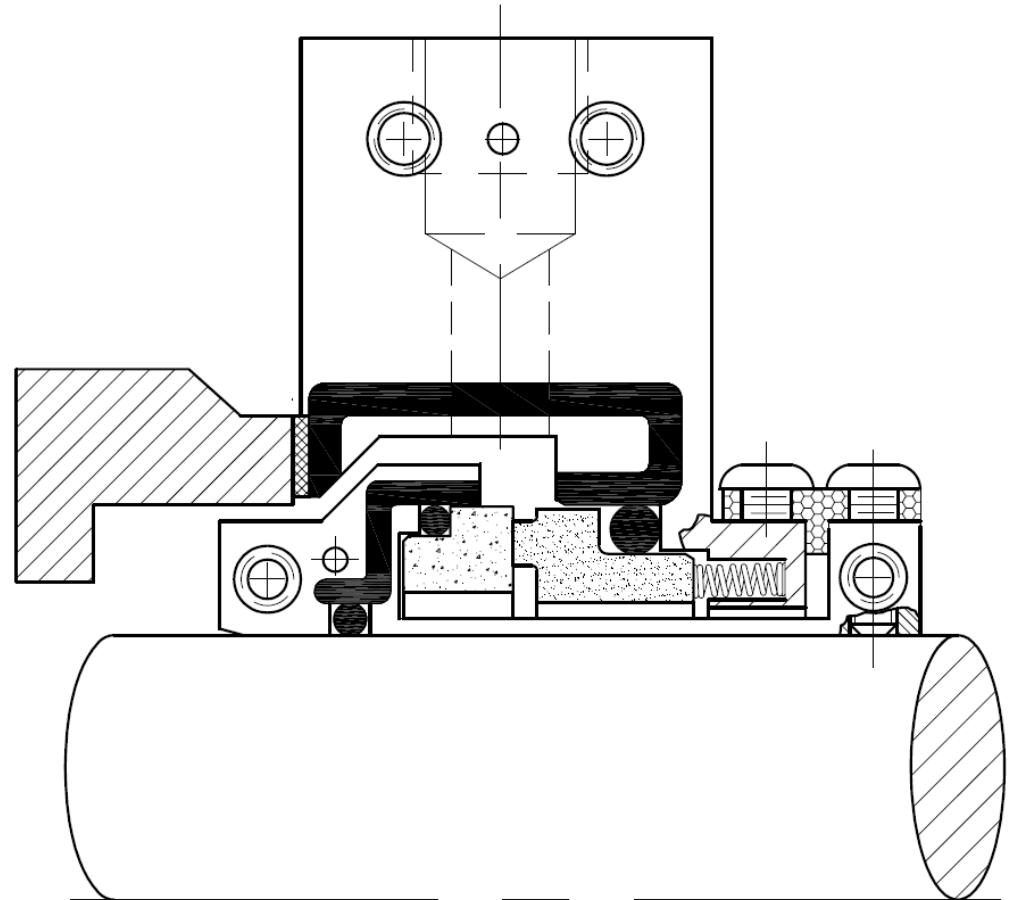




# Flex-A-Seal



## Style 85 SPLIT SEAL



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years

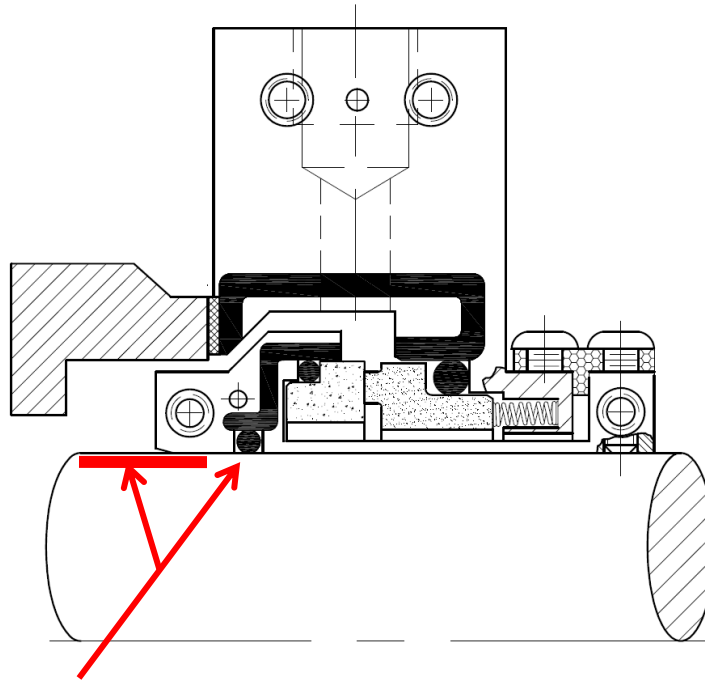




# Flex-A-Seal



## Style 85 SPLIT SEAL



**Packed Pumps are easily converted – shaft sleeve o-ring sits outside where packing wears on the shaft sleeve**

**Designed to fit majority of pumps and mixers without modification**

**Inside seal arrangement uses fluid pressure to help keep faces closed**



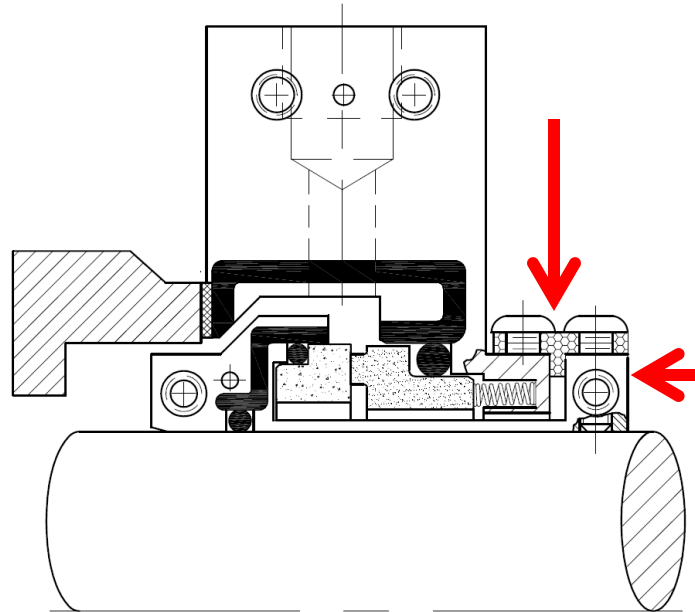
Fluid Sealing “Solution Providers”  
Worldwide for 30 Years







## Style 85 SPLIT SEAL



**Cartridge Style Setting Clips**

- Assures axial and radial alignment
- No measurements, shims, or special tools required
- Impeller can be adjusted without dismantling the seal by simply replacing the clips and loosening the set screws
- All other split seals require complete seal disassembly to make impeller adjustments

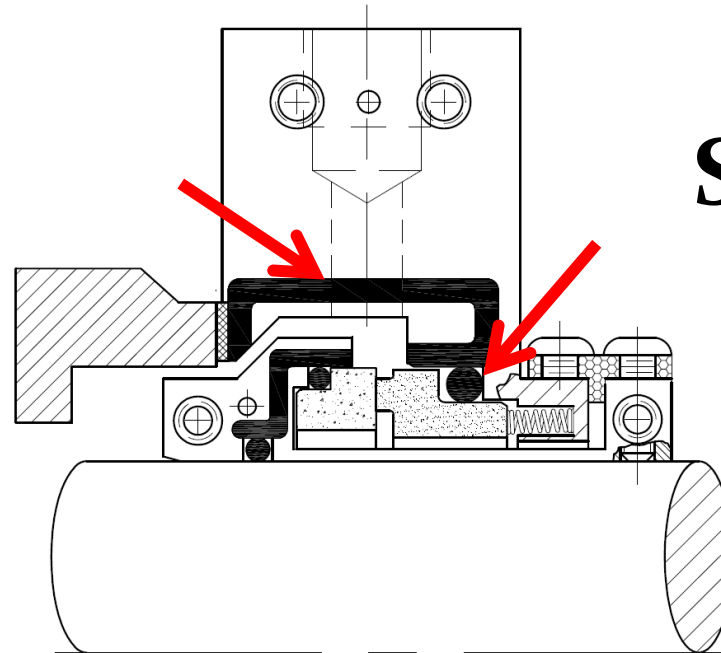




# Flex-A-Seal



## Style 85 SPLIT SEAL



**Centrifugal force keeps product away from seal faces**

**Springs are located out of the product and protected by an “o” ring to eliminate clogging**

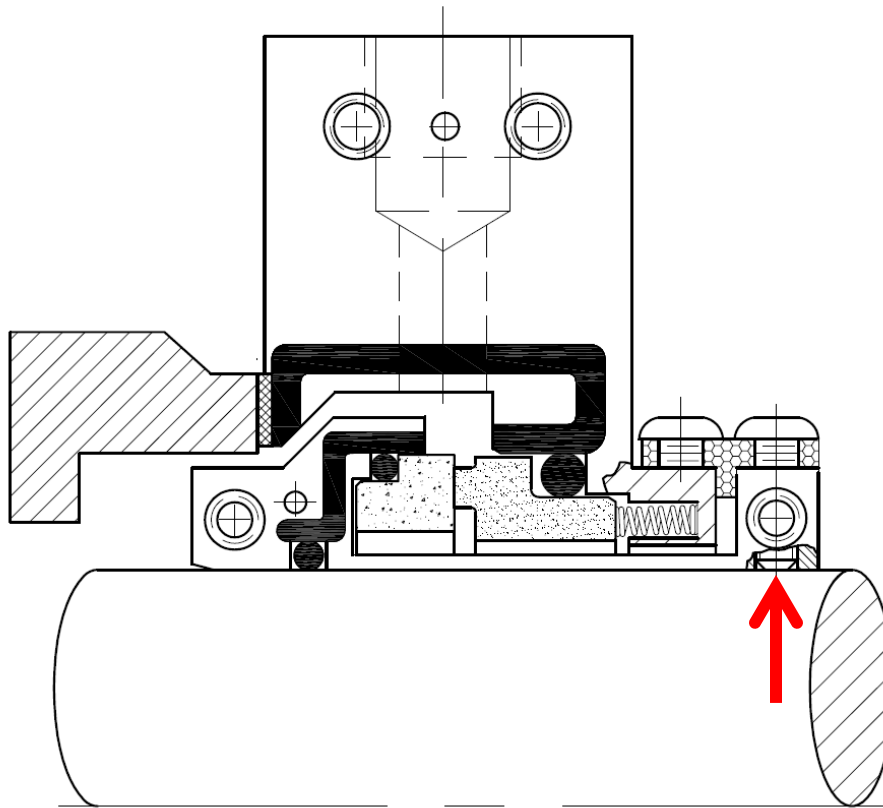


Fluid Sealing “Solution Providers”  
Worldwide for 30 Years





## Style 85 SPLIT SEAL



**Cup point set screws transmit torque and prevent axial motion**

- Most split seals rely on some sort of clamped elastomer that is vulnerable to slippage and elastomeric breakdown





# Flex-A-Seal



## MATERIALS

### Metallurgy:

316 Stainless Steel

Hastelloy-C276<sup>®</sup> Springs

### Faces:

Carbon

Silicon Carbide

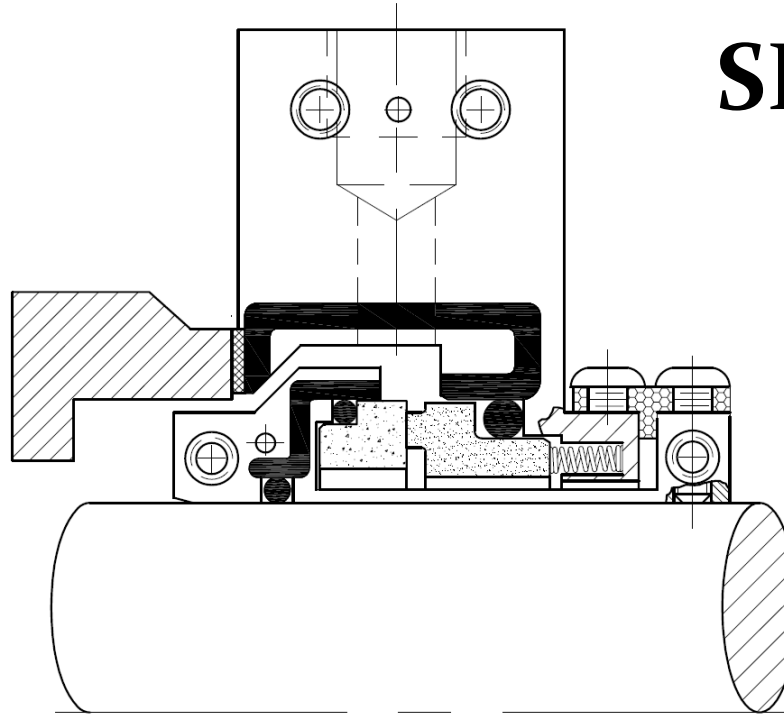
### Elastomers:

Viton<sup>™</sup>

Aflas<sup>™</sup>

\*\*\*FDA APPROVED OPTIONS AVAILABLE

# Style 85 SPLIT SEAL

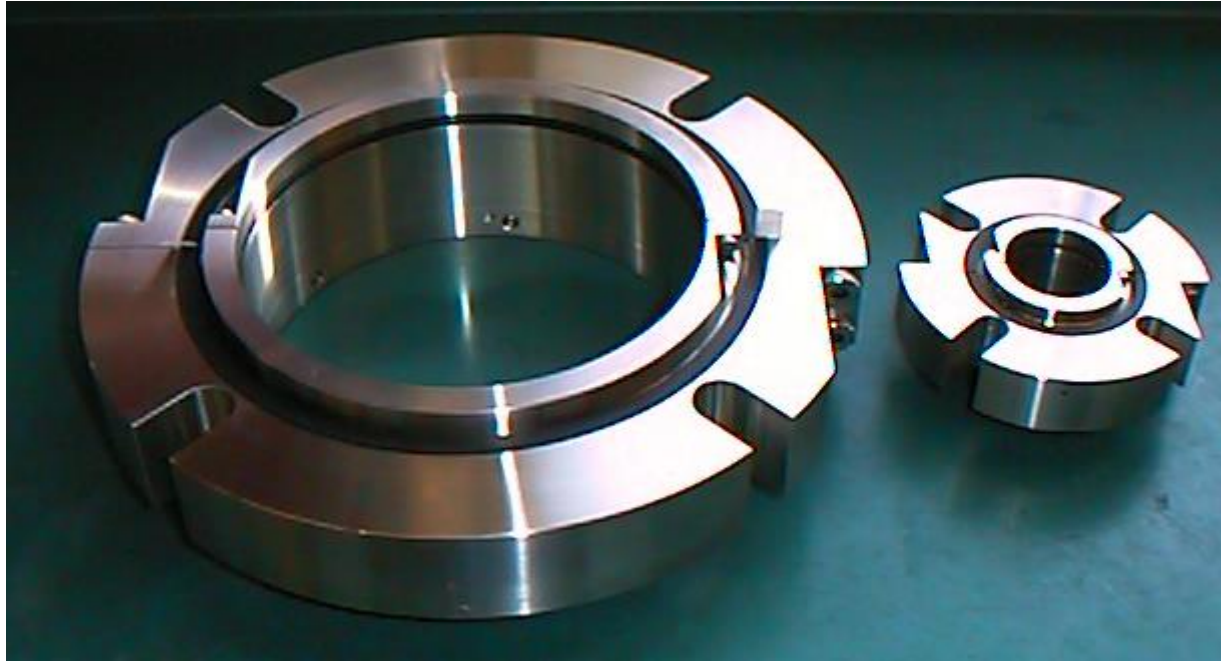


Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



**1" to 9" shaft diameters available**  
**Metric sizes range 45mm-219mm**



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





**Flex-A-Seal**



## INSTALLATION VIDEOS:

- <http://www.flexaseal.com/>
- <https://www.youtube.com/watch?v=fPyHAdSbrQ>
- <https://www.youtube.com/watch?v=HO8iRyP-W28>



Fluid Sealing “Solution Providers”  
Worldwide for 30 Years





**Flex-A-Seal**



# The Pack Ryt™ System



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years

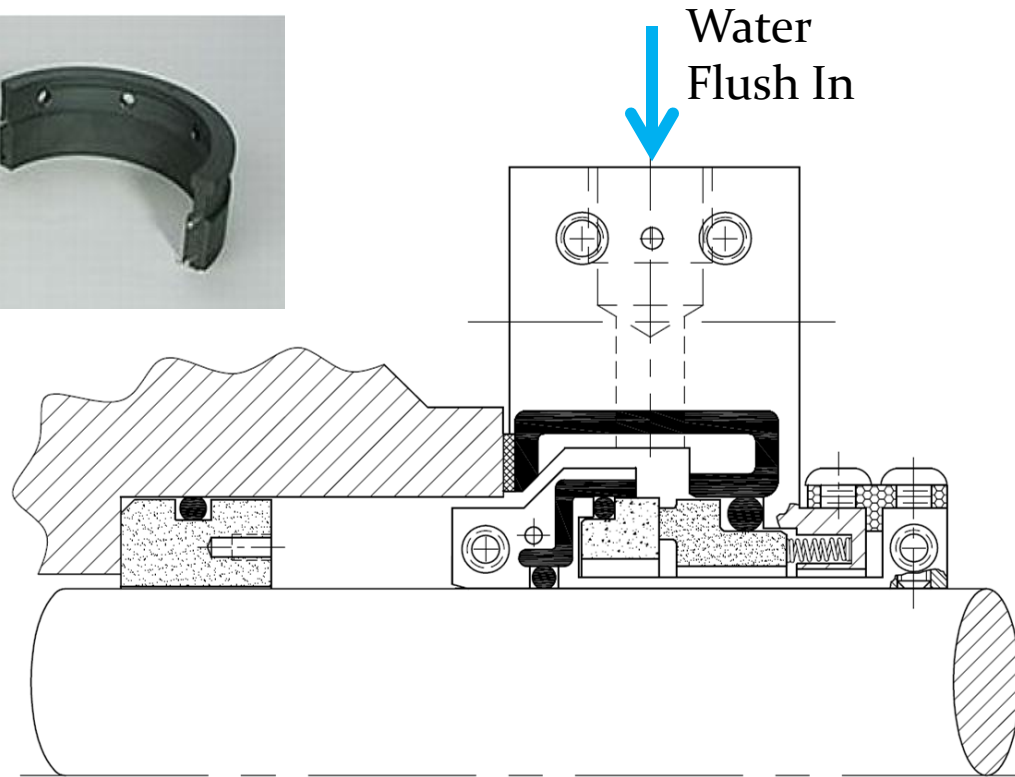




# Flex-A-Seal



## Style 85 SPLIT SEAL working with The Pack Ryt™ System



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





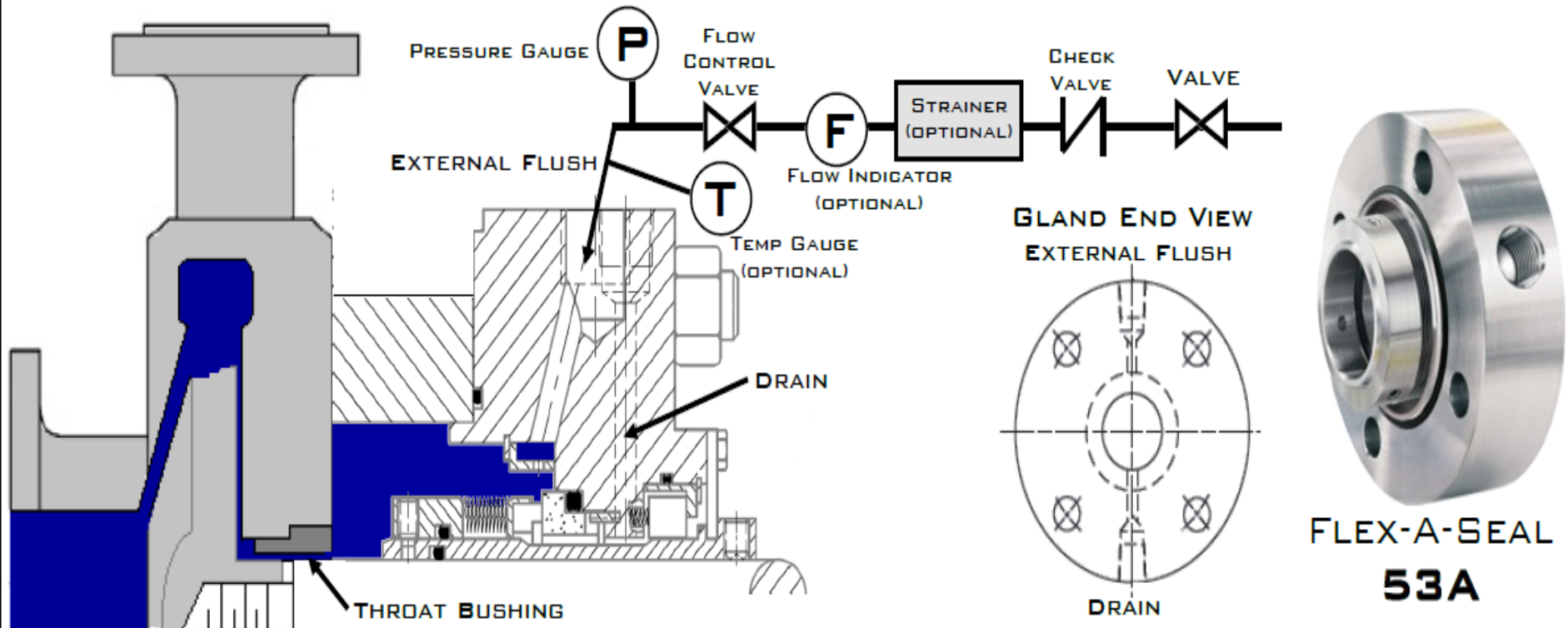
# PLAN - 32

## EXTERNAL FLUSH SYSTEM

**INTENT** - USED IN SERVICES CONTAINING SOLIDS OR CONTAMINANTS, WHERE A CLEAN COOLER COMPATIBLE FLUSH AT A HIGHER PRESSURE WILL IMPROVE THE SEAL ENVIRONMENT - PRODUCT DILUTION WILL OCCUR

**BENEFITS** - CLEAN, COOL EXTERNAL FLUSH FLUID EXTENDS SEAL LIFE BY REMOVING HEAT AND KEEPING ABRASIVE AWAY FROM SEAL FACES

**CONVENTION** - APPLIED WITH A CLOSE-CLEARANCE THROAT BUSHING THAT FUNCTIONS AS A THROTTLING DEVICE TO RAISE SEAL CHAMBER PRESSURE OR ACT AS BARRIER TO ISOLATE PRODUCT FROM THE SEAL CHAMBER





# Flex-A-Seal



## Flex-A-Seal Style 85WS (water saver):

**BEARING BUSHING INSTALLATION INSTRUCTIONS:**

1. THOROUGHLY CLEAN SHAFT AND STUFFING BOX.
2. VERIFY SHAFT & BORE DIMENSIONS vs DIMENSIONS SHOWN.
3. MEASURE & RECORD DEPTH OF STUFFING BOX.
4. CUT O-RING (1-PLACE) WITH SHARP BLADE.
5. PUT BEARING-BUSHING HALVES TOGETHER OVER SHAFT, ALIGNING PINS WITH HOLES. ENSURE THAT THE EXTRACTION HOLES ARE FACING OUT AWAY FROM THE BOX.
6. SLIDE BEARING-BUSHING PARTIALLY INTO BOX, OR USE A SECOND PERSON TO HOLD THE TWO HALVES TOGETHER.
7. PUT O-RING INTO GROOVE, GLUE ENDS TOGETHER.
8. SLIDE BEARING-BUSHING, O-RING INTO BOTTOM OF STUFFING BOX.
9. MEASURE DEPTH OF BOX TO BEARING-BUSHING. VERIFY THAT THE DIFFERENCE BETWEEN THIS AND THE INITIAL DEPTH MEASUREMENT EQUALS THE BEARING-BUSHING LENGTH. THIS WILL ENSURE THAT THE BEARING-BUSHING IS SEATED CORRECTLY IN THE BOTTOM OF THE BOX.

**NOTE:**  
WATER FLUSH MUST BE MAINTAINED (15-20) PSI ABOVE BOX PRESSURE

ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	3 3/4" SPLIT SEAL	FS50462	1	CARBON/SILICON/VITON/316/HAST-C SPRINGS
2	BEARING-BUSHING	FS17255-06	1	CARBON FIBER - GRAPHITE THERMOPLASTIC / VITON

		P.O. BOX 184 / 1 JACKSON ST. ESSEX JUNCTION, VT 05453 (802) 878-8307	
CUSTOMER:			
LOCATION:			
PRODUCT:			
TEMP:		SPEED:	
PRESSURE:			
SEAL CODE: 608503C2V52			
JOB#: ENG108			
SCALE: NONE		DRAWN BY: JK DATE: 11/28/06	
STYLE 85 FULLY SPLIT CARTRIDGE SEAL WITH SPLIT O-RING MOUNT STUFFING BOX BEARING-BUSHING FOR GOULDS 3175M PUMP			SIZE 3 3/4
DWG.#: FS54567			REV.

### Flex-A-Seal Fully Split Cartridge Seal with Water Saver

Model: 85 WS

#### Advantages:

- Ease of installation - Pump does not have to be disassembled to change the 85 WS. This is a huge time and labor cost savings when a seal change out is needed.
- Use existing stuffing box - Don't need the added expense of replacing the current stuffing box with a new costly mechanical seal adapter typically purchased from the pump OEM.
- Huge Water Savings - Reference Table 5 page 10 in the Goulds Model 5500 Installation Manual For smallest size Frame B1 (2 1/2 Sleeve) Flush Water Requirement is 19 GPM or 27,360 Gallons per Day. Using the 85 WS this flush can be reduced below 1/2 GPM assuming a 15 PSI differential. For Largest Size Frame B5 (8 Sleeve) Flush Water requirement is 70 GPM or 100,800 Gallons per Day. Using the 85 WS this flush can be reduced below 5 GPM assuming a 15 PSI differential.
- Provides Radial Bearing Support- Very important in older pump models that may have used the packing rings to support the shaft.



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



## PACK-RYT®

“A Winning Combination”

Flex-A-Seal mechanical seals with a Pack Ryt® bearing/bushing “ORM” O-ring mount design.

This patented design is a proven problem solving solution which addresses two common problems, of radial shaft movement and the need to reduce excessive water flush consumption commonly found in process plants around the world. This design requires no modification to the existing rotating equipment.

The “ORM” bearing/ bushing was developed to provide additional bearing support to centralize and stabilize the rotating shaft in the stuffing box/seal chamber. In addition to this it can significantly reduce the amount of water or flush media going into the sealed product. To achieve this goal a special compression molded proprietary blend of carbon fiber, graphite and thermoplastic material was developed. This material has excellent strength, thermal and chemical resistant properties and is self lubricating. The ORM has moved the typical bushing design which has traditionally, worn out easily, experienced increased leakage and wear on sleeves or shafts to a truly superior bearing design.

Common rotating equipment which has excessive radial shaft movement includes:

- **Centrifugal pumps:** In a perfect world these pumps would operate exactly as designed and run at their “BEP” Best Efficiency Point. But in the real world the pumps can actually run at the extreme left or right of the BEP of its performance curve. When this happens the shaft will suffer a deflection load between the equipment bearings and impeller. In the area of the mechanical seal this will cause vibration and radial shaft movement which can misalign the rotating and stationary components of the mechanical seal. This leads to fatigue of the mechanical seal components, leakage and ultimate failure of the mechanical seal.
- **Vertical pumps:** Long slender shafts with little support.

- **Horizontal split case pumps:** Due to the long over hang between bearings the shaft can sag, particularly in the older pump designs which relied on the packing rings to provide shaft support. This becomes a problem when the pump has been converted to a mechanical seal.
- **Agitators and mixers:** With long overhung shaft designs top, side and bottom entry.

### Advantages:

- Stabilizing the shaft will increase the MTBF of the rotating equipment by increasing the life of the mechanical seal and bearing.
- Significantly reduces the volume of water or flushing media into the process. Very important for process plants looking to conserve water consumption.
- Eliminates the need for a flowmeter which can clog over a period of time, then choking off the flush which will cause the mechanical seal to fail prematurely.
- Improves the sealing environment for longer mechanical seal life. With the tighter bearing clearance between the ORM and the shaft allows the velocity of the water or flushing media to keep abrasives and solids from entering the stuffing box.
- Easy Installation; simply slide the ORM down the stuffing box until it contacts the throat of the box. An O-ring on the outside diameter of the ORM will seal the stuffing box bore.
- Available in solid or split arrangements the split arrangement is ideal when used with the style 85 split cartridge seal. This eliminates the time needed to disassemble the equipment.
- With the self lubricating properties of the ORM material it will not wear the stainless steel shaft or sleeve. This eliminates the need and cost to harden them.



Fluid Sealing “Solution Providers”  
Worldwide for 30 Years





# Flex-A-Seal



## CASE STUDY

### South East

- June 7, 2011 -

Flex-A-Seal's Patented **Style 85 Split Cartridge Seal 9" I.D.** was recently installed at a large fossil plant in the South East. **The entire mechanical seal installation, including split adapter plate and bushing, was completed in 21 MINUTES and subsequently performed perfectly.** Because the Style 85 Split Seal is fully assembled and pressure tested at Flex-A-Seal, sealing integrity is insured completely before being sent to the field, ensuring each installation the highest success rate.

“We have saved hundreds of man hours using Flex-A-Seal's patented Style 85 Split Cartridge Seal over the years. Installing a mechanical seal of this size in under 21 minutes is unheard of in our industry. The split seal actually performs better than the traditional seals we have purchased from other manufacturers in the past.”



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years



Don H. - Plant Manager





**Flex-A-Seal**



## CASE STUDY

## Washington DC

A large wastewater plant in Washington DC uses a **Morris MF80** sludge pump with a 3 3/4" shaft. Previous seal installations required pulling out the shaft and bearings, bolting the seal to the pump, then feeding the shaft back through the seal. The entire process typically took two production days. **We installed a patented Style 85 split cartridge seal in fifteen (15) minutes.** This seal has continued to run over one year without incident. Flex-A-Seal has proven the economic and time benefits of easy installation and low maintenance in waste water treatment plants all over the country.



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





**Flex-A-Seal**



## CASE STUDY

**Indiana**

A US steel mill in Indiana uses **Goulds** vertical pumps to move dirty water for their descaling process. Previous sealing methods proved unsuccessful and the end user became very unhappy with the lack of technical support when seals continued to fail. We were called in to analyze the situation and verified our patented Style 85 fully split cartridge seal would operate successfully in the process. We proposed the design, explaining the installation and maintenance benefits. The end user installed their first **Style 85** in less than thirty (30) minutes and the seal has been operating trouble-free.



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





**Flex-A-Seal**



## ANHEUSER-BUSCH REFERENCES:



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



Flex-A-Seal, Inc.  
One Jackson Street  
Essex Junction, VT 05452 USA



Phone 802-878-8307  
Fax 802-878-2479  
Web [www.flexaseal.com](http://www.flexaseal.com)  
E-Mail [sales@flexaseal.com](mailto:sales@flexaseal.com)

Confirmation ID: ORD-12152-RG0058  
Order ID: 5011708  
Quote ID: QUO-11701-53044  
Order Date: 9/11/2014  
Sales Rep: Inside Sales (House Account)  
Customer Shipping Account Number:

**Shipping Information**  
Ship To:  
Anheuser-Busch Willamberg  
7801 Pochontas Trail  
Willamberg, VA 23185  
USA  
Tag Number: SAP # 1473559

Part #	Description	Unit	Quantity	Price
P531042	446503CV62 STYLE BS SPLIT CARTRIDGE SEAL	Each	1.00000	

Notes:  
\*\*\*PLEASE CALL FOR PACKING LIST AND SHIPPING INSTRUCTIONS WHEN READY TO SHIP\*\*\*

9/23/2014 10:22 AM Prepared by: Hardin, Steve / [shardin@flexaseal.com](mailto:shardin@flexaseal.com)

Flex-A-Seal, Inc.  
One Jackson Street  
Essex Junction, VT 05452 USA



## Sales Order

Phone 802-878-8307  
Fax 802-878-2479  
Web [www.flexaseal.com](http://www.flexaseal.com)  
E-Mail [sales@flexaseal.com](mailto:sales@flexaseal.com)

Confirmation ID: ORD-12152-RG0058  
Order ID: 5009555  
Quote ID: 5009555  
Order Date: 3/28/2014  
Sales Rep: Inside Sales (House Account)  
Customer PO: 28065  
Requestor: Williams, Chera  
Customer Shipping Account Number:

**Shipping Information**  
Ship To:  
Anheuser-Busch Willamberg  
7801 Pochontas Trail  
Willamberg, VA 23185  
USA

Part #	Description	Unit	Quantity	Price	Discount
P550454	446503CV62 STYLE BS SPLIT CARTRIDGE SEAL	Each	1.00000		\$0.00

Notes:  
SAP # 1515763

9/23/2014 10:30 AM Prepared by: Haggerty, Lisa / [lhah@flexaseal.com](mailto:lhah@flexaseal.com)

Flex-A-Seal, Inc.  
One Jackson Street  
Essex Junction, VT 05452 USA



## Sales Order

Phone 802-878-8307  
Fax 802-878-2479  
Web [www.flexaseal.com](http://www.flexaseal.com)  
E-Mail [sales@flexaseal.com](mailto:sales@flexaseal.com)

Confirmation ID: ORD-12165-K02W04  
Order ID: 5009371  
Quote ID: 5009371  
Order Date: 3/28/2014  
Sales Rep: Inside Sales (House Account)  
Customer Shipping Account Number:

**Shipping Information**

Ship To:  
Anheuser-Busch Willamberg  
7801 Pochontas Trail  
Willamberg, VA 23185  
USA

Part #	Description	Unit	Quantity	Price	Discount	Sub Total
P550448	32803CV62 STYLE BS SPLIT CARTRIDGE SEAL	Each	2.00000	\$1,393.60	\$0.00	

Notes:  
SAP # 1584907

9/23/2014 02:46 PM  
Flex-A-Seal, Inc.  
One Jackson Street  
Essex Junction, VT 05452 USA



## Sales Order

Phone 802-878-8307  
Fax 802-878-2479  
Web [www.flexaseal.com](http://www.flexaseal.com)  
E-Mail [sales@flexaseal.com](mailto:sales@flexaseal.com)

Confirmation ID: ORD-12162-C2R259  
Order ID: 5011872  
Quote ID: QUO-05885-X88B00  
Order Date: 6/3/2014  
Sales Rep: Inside Sales (House Account)  
Customer Shipping Account Number:

**Shipping Information**

Ship To:  
Anheuser-Busch Merrimack Bowler  
221 Daniel Webster Hwy  
Merrimack, NH 03054  
USA

Part #	Description	Unit	Quantity	Price	Discount	Sub Total
P55663M34	446503CV62 STYLE BS SPLIT CARTRIDGE SEAL - FDA VITON O-RINGS	Each	2.00000		\$0.00	

Notes:  
ENGINEERING 2 WEEKS - VENDOR TO PRODUCTION ASAP  
SAP# 1010097  
CALL 1-573-883-2373 FOR PACKING SLIP WHEN READY FOR SHIPMENT

9/23/2014 02:55 PM Prepared by: Haggerty, Lisa / [lhah@flexaseal.com](mailto:lhah@flexaseal.com) Page 1 of 1



Fluid Sealing "Solution Provider"  
Worldwide for 30 Years





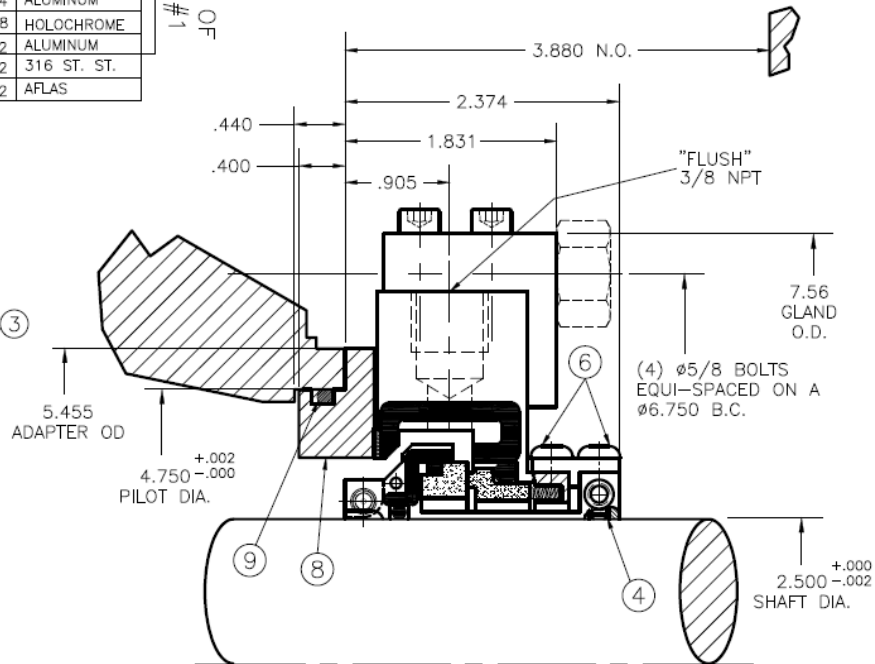
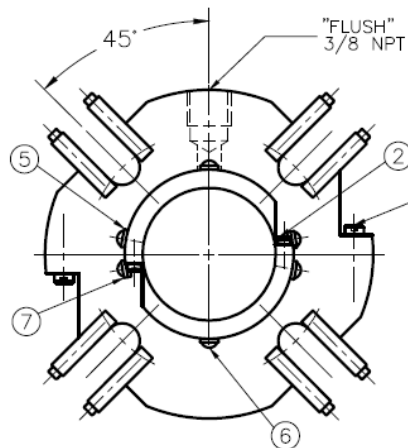
# Flex-A-Seal



ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SPLIT CARTRIDGE SEAL	FS56637M24	1	
2	SLEEVE SHOULDER BOLT	FS11680	4	316 ST. ST.
3	GLAND SHOULDER BOLT	FS10050-03	4	316 ST. ST.
4	CUP POINT SET SCREW	1/4-20x3/8 LG.	4	316 ST. ST.
5	SETTING CLIP	FS11371	4	ALUMINUM
6	BUTTON HEAD CAP SCREW	10-24x3/8 LG.	8	HOLOCHROME
7	SETTING CLIP	FS16745	2	ALUMINUM
8	SOLID BIG BORE ADAPTER	FS22479	2	316 ST. ST.
9	ADAPTER PKG	FS568-AF-246	2	AFLAS

PART OF  
ITEM #1

NOTE:  
1. INSTALL ADAPTER, ITEM #8, WHEN PUMP IS DISASSEMBLED  
2. REFERENCE SK1070 FOR INSTALLATION/ ASSEMBLY INSTRUCTIONS FOR SPLIT SEAL



### MATERIALS

METAL PARTS- 316 ST. ST.  
ROTATING FACE- SILICON  
STATIONARY FACE- SILICON CARBIDE  
ELASTOMER- AFLAS  
SPRINGS- HAST C

CUSTOMER:	ANHEUSER-BUSCH	JOB#	S010272
LOCATION:	ANHEUSER-BUSCH MERRIMACK BREWERY		
PRODUCT:			
TEMP.:			
PRESSURE:	SPEED:		
SEAL CODE:	4085X03S4VS4		

STYLE 85X STATIONARY  
MULTI-SPRING FULLY SPLIT  
CARTRIDGE SEAL WITH SOLID  
BIG BORE ADAPTER FOR  
GOULDS 3196 XLT BIG OR  
TAPER BORE PUMP

SCALE: NONE | DRAWN BY: MC | DATE: 7/16/14

**FLEX-A-SEAL, INC.**  
P.O. BOX 184 / 1 JACKSON ST.  
ESSEX JUNCTION, VT 05453  
(802) 878-8307

**FS56635M24**

SIZE  
2 1/2  
REV.



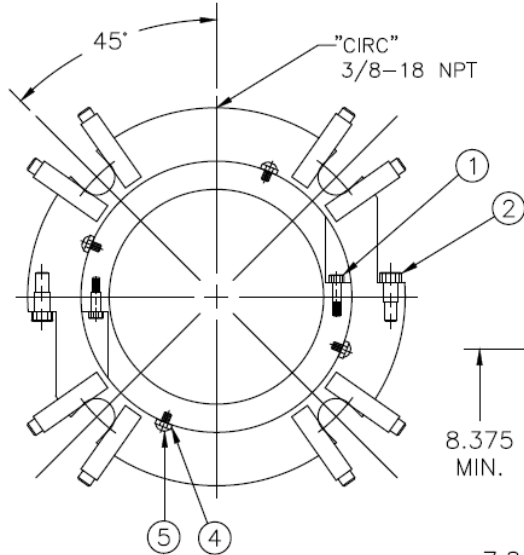
Fluid Sealing "Solution Providers"  
Worldwide for 30 Years



# Flex-A-Seal

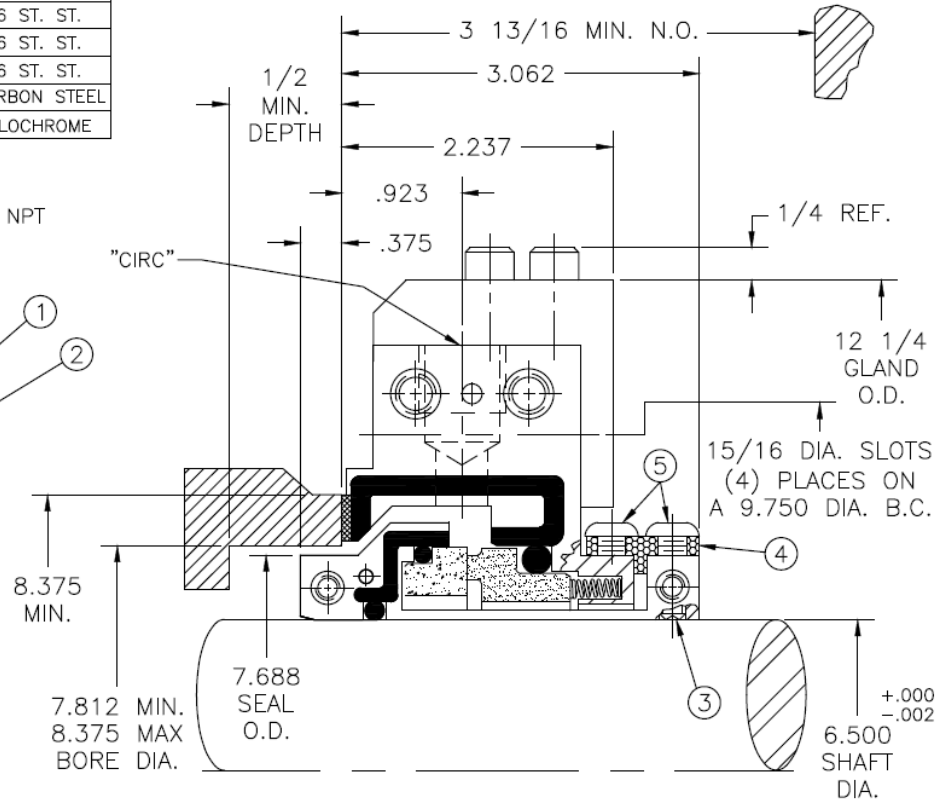


ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SHOULDER BOLT	FS10050-03	4	316 ST. ST.
2	SHOULDER BOLT	FS10050-08	4	316 ST. ST.
3	CUP POINT SET SCREW	1/4-20x3/8 LG.	4	316 ST. ST.
4	SETTING CLIP	FS11371	4	CARBON STEEL
5	BUTTON HEAD CAP SCREW	10-24x3/8 LG.	8	HOLOCHROME



**MATERIALS**

METAL PARTS- 316 ST.ST.  
 ROTATING FACE- SILICON CARBIDE  
 STATIONARY FACE- CARBON  
 ELASTOMERS- VITON  
 SPRINGS- HAST C



U.S. PATENT NO. 5662340

NOTE REFERENCE SK1070 FOR INSTALLATION/ ASSEMBLY INSTRUCTIONS	CUSTOMER: ANHEUSER-BUSCH JOB# S011706	STYLE 85 STATIONARY MULTI-SPRING FULLY SPLIT CARTRIDGE SEAL FOR BOTTOM ENTRY, VERTICAL SHAFT MIXER	<b>FLEX-A-SEAL, INC.</b> P.O. BOX 184/ 1 JACKSON ST. ESSEX JUNCTION, VT 05453 (802) 878-8307	SIZE 6 1/2			
	LOCATION: ANHEUSER-BUSCH WILLIAMSBURG			DRAWING NO.: <b>FS51042</b>	REV.		
	PRODUCT: BEER MASH				SCALE: NONE	DRAWN BY: BP	DATE: 3/11/98
	TEMP.:						
	PRESSURE: ATOMOSPHERIC SPEED:						
SEAL CODE: 1048503C2VS2							



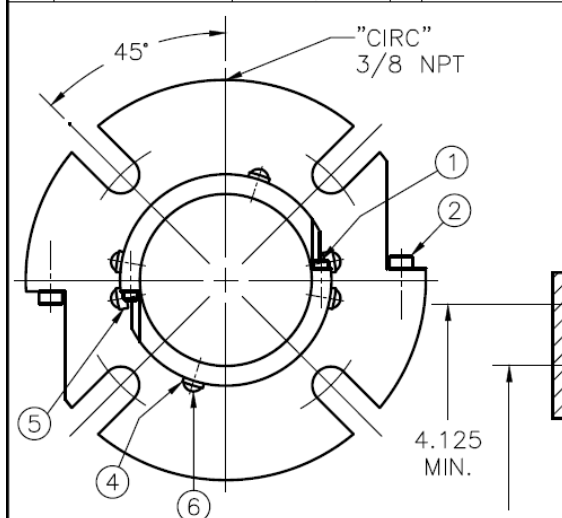
Fluid Sealing "Solution Providers"  
 Worldwide for 30 Years



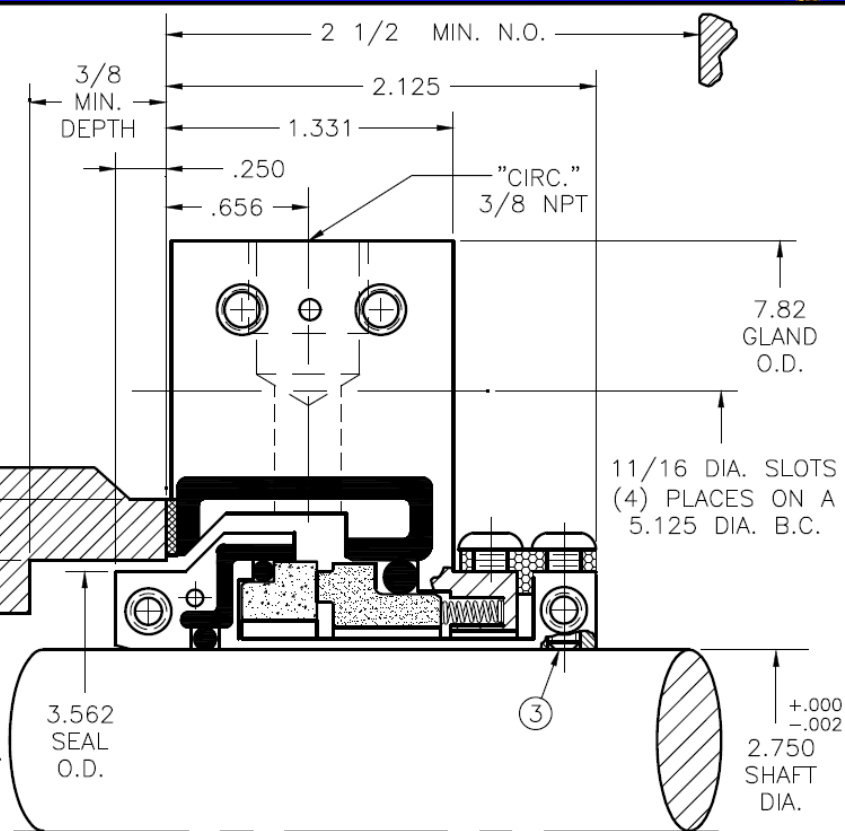
# Flex-A-Seal



ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SHOULDER BOLT	FS11680	4	316 ST. ST.
2	SHOULDER BOLT	FS10050-03	4	316 ST. ST.
3	CUP POINT SET SCREW	1/4-20x3/8 LG.	4	316 ST. ST.
4	SETTING CLIP	FS11371	4	ALUMINUM
5	SETTING CLIP	FS16745	2	ALUMINUM
6	BUTTON HEAD CAP SCREW	10-24x3/8 LG.	8	HOLOCHROME



**MATERIALS**  
 METAL PARTS- 316 ST. ST.  
 ROTATING FACE- SILICON CARBIDE  
 STATIONARY FACE- CARBON  
 ELASTOMER- VITON  
 SPRINGS- HAST C



U.S. PATENT NO. 5662340

REV	ECN#	DATE	REV BY
1	1784	9/29/06	B.P.

<b>CUSTOMER:</b>	ANHEUSER-BUSCH	<b>JOB#</b>	S009355
<b>LOCATION:</b>	ANHEUSER-BUSCH WILLIAMSBURG		
<b>PRODUCT:</b>	HOT WATER		
<b>TEMP.:</b>			
<b>PRESSURE:</b>	<b>SPEED:</b>		
<b>SEAL CODE:</b>	448503C2VS2		

STYLE 85 STATIONARY  
 MULTI-SPRING FULLY SPLIT  
 CARTRIDGE SEAL FOR A  
 PEERLESS SPLIT CASE PUMP

SCALE: NONE    DRAWN BY: RB    DATE: 1/6/95

**FLEX-A-SEAL, INC.**  
 P.O. BOX 184/ 1 JACKSON ST.  
 ESSEX JUNCTION, VT 05453  
 (802) 878-8307

DWG. NO.:  
**FS50454**

SIZE  
 2 3/4

REV.  
 1



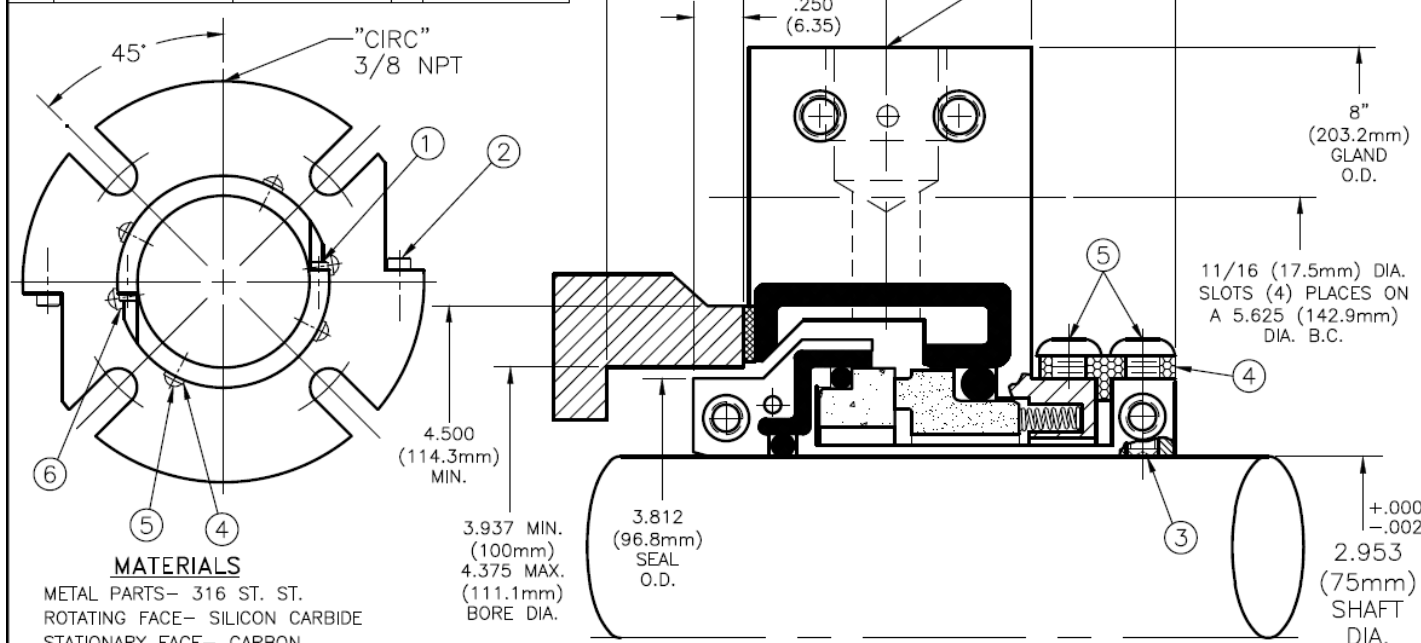
Fluid Sealing "Solution Providers"  
 Worldwide for 30 Years



# Flex-A-Seal



ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SHOULDER BOLT	FS11680	4	316 ST. ST.
2	SHOULDER BOLT	FS10050-03	4	316 ST. ST.
3	CUP POINT SET SCREW	1/4-20x3/8 LG.	4	316 ST. ST.
4	SETTING CLIP	FS11371	4	ALUMINUM
5	BUTTON HEAD CAP SCREW	10-24x3/8 LG.	8	HOLOCHROME
6	SPECIAL SETTING CLIP	FS16745	2	ALUMINUM



**MATERIALS**  
 METAL PARTS- 316 ST. ST.  
 ROTATING FACE- SILICON CARBIDE  
 STATIONARY FACE- CARBON  
 ELASTOMER- VITON  
 SPRINGS- HAST C

U.S. PATENT NO. 5662340

REV	ECN#	DATE	REV BY
1	1803	11/17/06	B.P.

<b>CUSTOMER:</b> ANHEUSER-BUSCH <b>JOB#</b> S005B25 <b>LOCATION:</b> ANHEUSER-BUSCH MERRIMACK BREWERY <b>PRODUCT:</b> <b>TEMP.:</b> <b>PRESSURE:</b> <b>SPEED:</b> <b>SEAL CODE:</b> 75MM8503C2VS2		<b>METRIC STYLE 85 STATIONARY MULTI-SPRING FULLY SPLIT CARTRIDGE SEAL</b> <b>SCALE:</b> NONE <b>DRAWN BY:</b> BP <b>DATE:</b> 7/17/01		<b>FLEX-A-SEAL, INC.</b> P.O. BOX 184/ 1 JACKSON ST. ESSEX JUNCTION, VT 05453 (802) 878-8307 <b>DWG. NO.:</b> <b>FS51898</b>		<b>SIZE</b> 75 mm <b>REV.</b> 1	
---	--	--	--	---	--	--	--



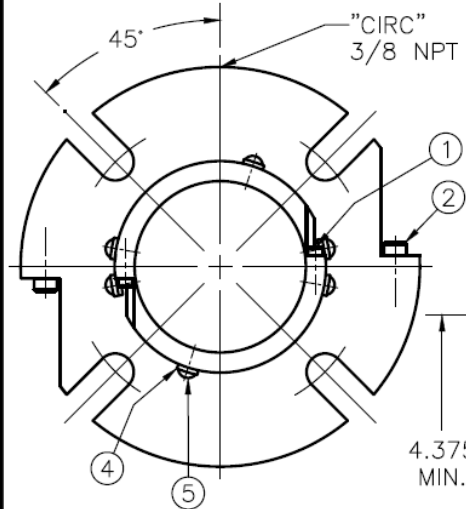
Fluid Sealing "Solution Providers"  
 Worldwide for 30 Years



# Flex-A-Seal



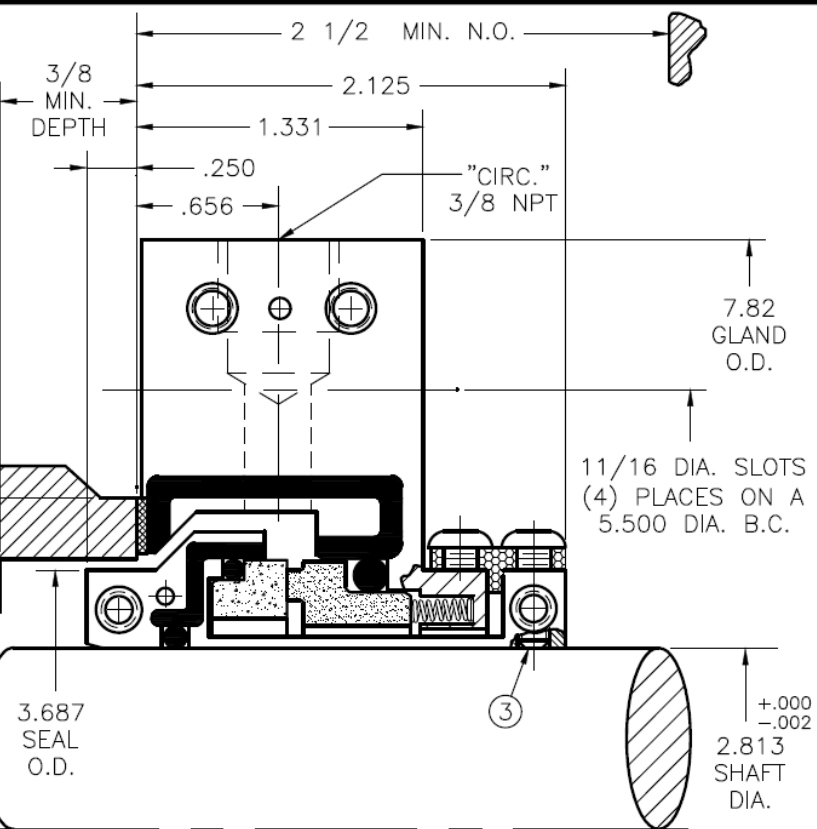
ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SHOULDER BOLT	FS11680	4	316 ST. ST.
2	SHOULDER BOLT	FS10050-03	4	316 ST. ST.
3	CUP POINT SET SCREW	1/4-20x3/8 LG.	4	316 ST. ST.
4	SETTING CLIP	FS11371	6	CARBON STEEL
5	BUTTON HEAD CAP SCREW	10-24x3/8 LG.	8	HOLOCHROME



### MATERIALS

METAL PARTS- 316 ST. ST.  
 ROTATING FACE- SILICON CARBIDE  
 STATIONARY FACE- CARBON  
 ELASTOMER- FDA VITON O-RINGS / VITON GASKETS  
 SPRINGS- HAST C

4.375 MIN.  
 3.812 MIN.  
 4.250 MAX.  
 BORE DIA.



U.S. PATENT NO. 5662340

CUSTOMER: ANHEUSER-BUSCH JOB# S010272 LOCATION: ANHEUSER-BUSCH MERRIMACK BREWERY PRODUCT: TEMP.: PRESSURE:                      SPEED: SEAL CODE: 458503CXV SX	STYLE 85 STATIONARY MULTI-SPRING FULLY SPLIT CARTRIDGE SEAL		<b>FLEX-A-SEAL, INC.</b> P.O. BOX 184/ 1 JACKSON ST. ESSEX JUNCTION, VT 05453 (802) 878-8307		SIZE 2 13/16	
			DWG. NO.: <b>FS56613M34</b>		REV.	
			SCALE: NONE	DRAWN BY: AK	DATE: 6/9/14	



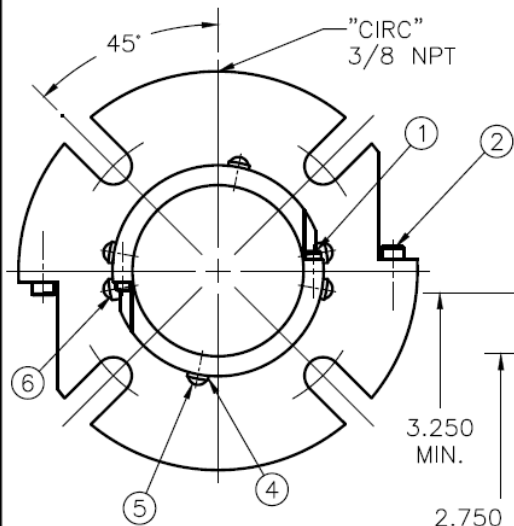
Fluid Sealing "Solution Providers"  
 Worldwide for 30 Years



# Flex-A-Seal



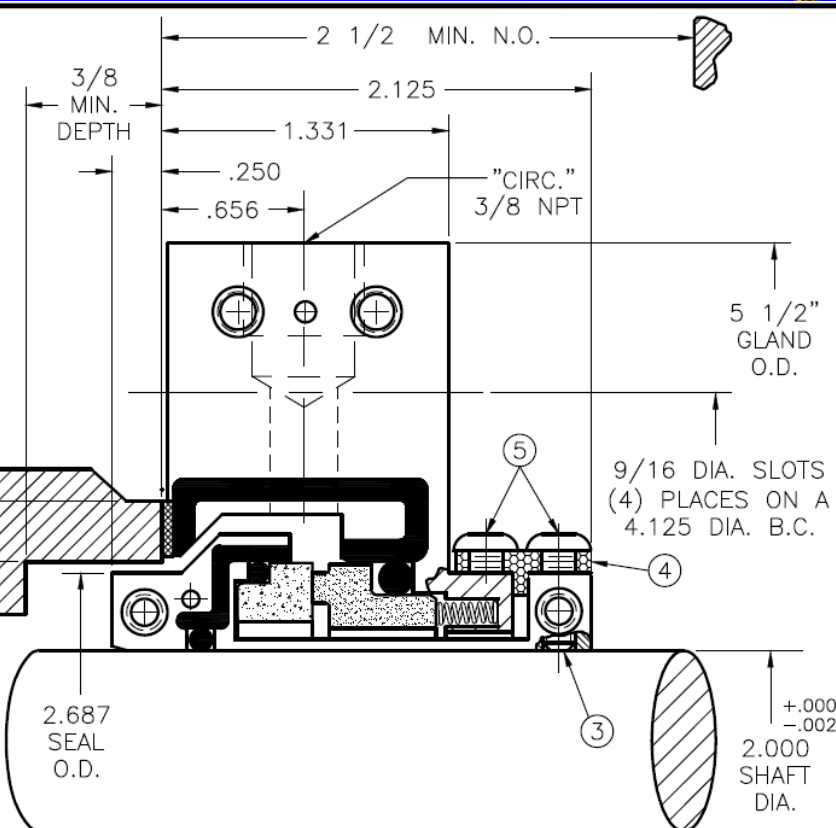
ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SHOULDER BOLT	FS11680	4	316 ST. ST.
2	SHOULDER BOLT	FS10050-03	4	316 ST. ST.
3	CUP POINT SET SCREW	1/4-20x3/8 LG.	4	316 ST. ST.
4	SETTING CLIP	FS11371	4	ALUMINUM
5	BUTTON HEAD CAP SCREW	10-24x3/8 LG.	8	HOLOCHROME
6	SPECIAL SETTING CLIP	FS16745	2	ALUMINUM



### MATERIALS

METAL PARTS- 316 ST. ST.  
 ROTATING FACE- SILICON CARBIDE  
 STATIONARY FACE- CARBON  
 ELASTOMER- VITON  
 SPRINGS- HAST C

2.750 MIN.  
 3.125 MAX.  
 BORE DIA.



U.S. PATENT NO. 5662340

REV	ECN#	DATE	REV BY
1	1642	5/23/05	B.P.

**NOTE**  
 REFERENCE  
 SK1070 FOR  
 INSTALLATION  
 ASSEMBLY  
 INSTRUCTIONS

<b>CUSTOMER:</b>	ANHEUSER-BUSCH	<b>JOB#</b>	S009371
<b>LOCATION:</b>	ANHEUSER-BUSCH WILLIAMSBURG		
<b>PRODUCT:</b>	CLEAN WATER		
<b>TEMP.:</b>	180°F		
<b>PRESSURE:</b>	<b>SPEED:</b>		
<b>SEAL CODE:</b>	328503C2VS2		

STYLE 85 STATIONARY  
 MULTI-SPRING FULLY SPLIT  
 CARTRIDGE SEAL FOR SPLIT  
 CASE PUMP

SCALE: NONE | DRAWN BY: RB | DATE: 6/16/95

**FLEX-A-SEAL, INC.**  
 P.O. BOX 184/ 1 JACKSON ST.  
 ESSEX JUNCTION, VT 05453  
 (802) 878-8307

DWG. NO.:  
**FS50448**

SIZE  
 2"

REV.  
 1



Fluid Sealing "Solution Providers"  
 Worldwide for 30 Years

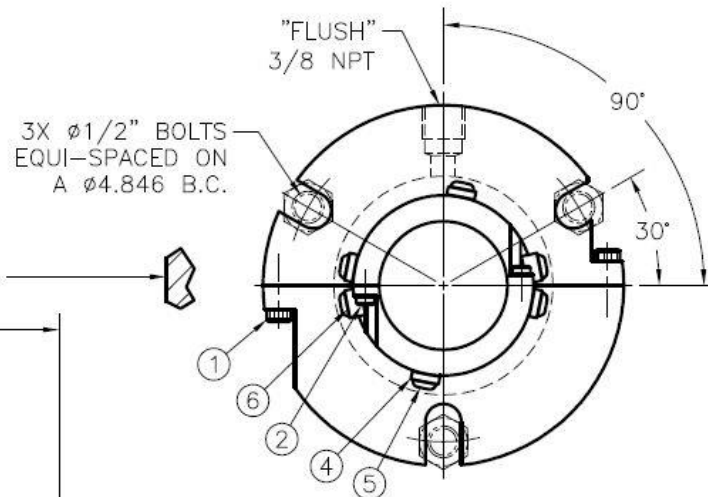
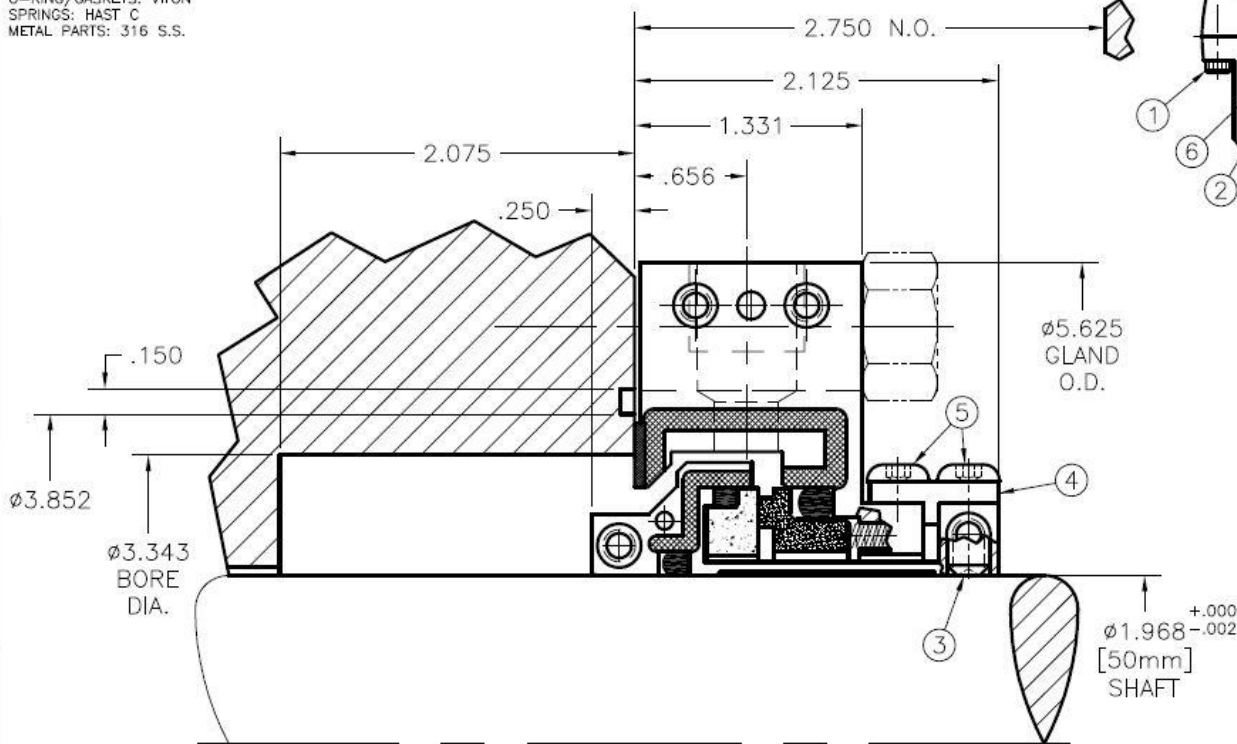


# Flex-A-Seal



ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SHOULDER BOLT	FS10050-03	4	316 ST. ST.
2	SHOULDER BOLT	FS11680	4	316 ST. ST.
3	CUP POINT SET SCREW	1/4-20x3/8 LG.	4	316 ST. ST.
4	SETTING CLIP	FS11371	4	ALUMINUM
5	BUTTON HEAD CAP SCREW	10-24x3/8 LG.	8	HOLLOCHROME
6	SPECIAL SETTING CLIP	FS16745	2	ALUMINUM

**MATERIALS**  
 STATIONARY SEAL RING: CARBON  
 ROTATING SEAL RING: SILICON CARBIDE  
 O-RING/GASKETS: VITON  
 SPRINGS: HAST C  
 METAL PARTS: 316 S.S.



		P.O. BOX 184 / 1 JACKSON ST. ESSEX JUNCTION, VT 05453 (802) 878-8307	
CUSTOMER:			
LOCATION:			
PRODUCT:			
TEMP.:		SPEED:	
PRESSURE:			
SEAL CODE: 50MM85X03C2VS2			
JOB#: S011175			
SCALE: NONE	DRAWN BY: BP	DATE: 9/2/14	
STYLE 85X STATIONARY MULTI-SPRING FULLY SPLIT CARTRIDGE SEAL FOR MODIFIED AHLSTROM APT 31-6 PUMP			SIZE 50mm
DWG.#: <b>FS56631</b>			REV.

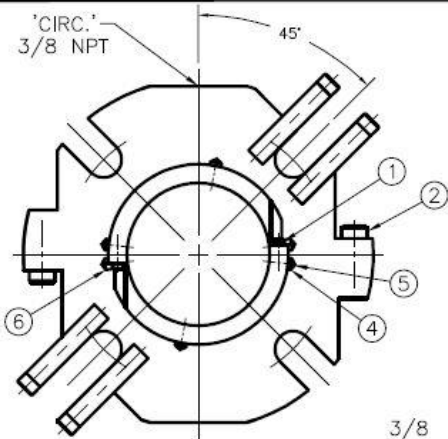


Fluid Sealing "Solution Providers"  
 Worldwide for 30 Years

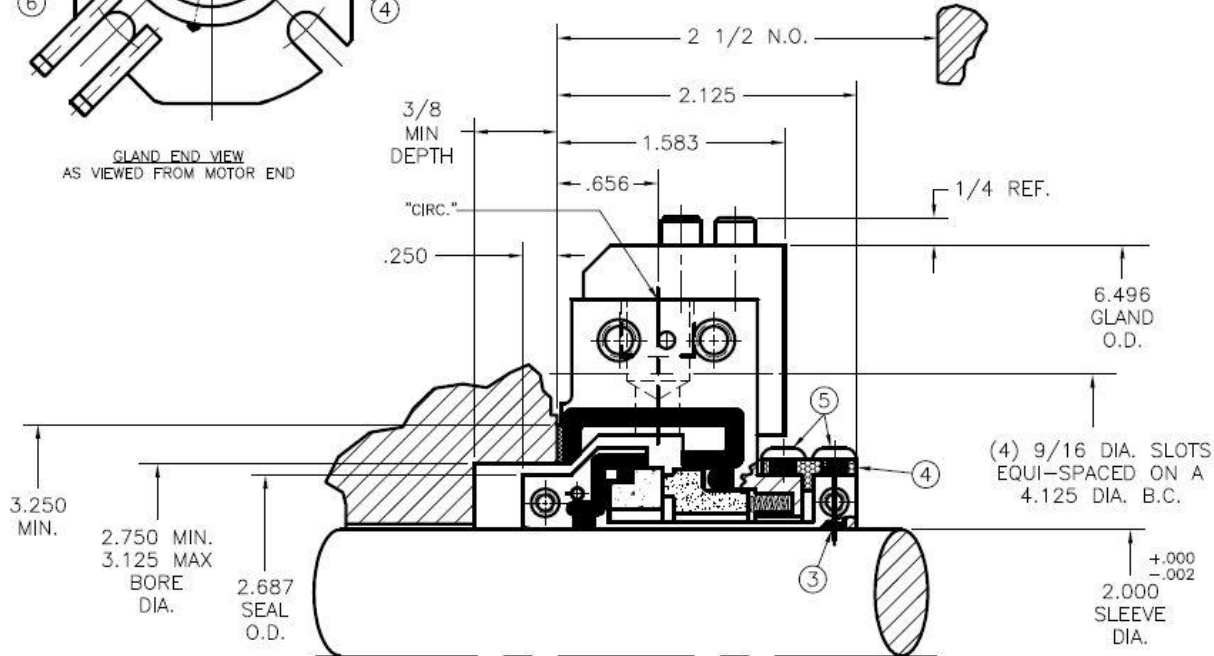




# Flex-A-Seal



GLAND END VIEW  
AS VIEWED FROM MOTOR END



ITEM	PART NAME	PART NUMBER	QTY	MATERIAL
1	SLEEVE SHOULDER BOLT	FS11680	4	316 S.S.
2	GLAND SHOULDER BOLT	FS10050-03	4	316 S.S.
3	CUP POINT SET SCREW	1/4-20 X 3/8 LG.	4	316 S.S.
4	SETTING CLIP	FS11371	4	ALUMINUM
5	BUTTON HEAD CAP SCREW	10-24 X 3/8 LG.	8	HOLOCHROME
6	SETTING CLIP	FS16745	2	ALUMINUM

MATERIALS OF SPLIT SEAL

METAL PARTS- 316 ST. ST.  
ROTATING FACE- SILICON CARBIDE  
STATIONARY FACE- CARBON  
ELASTOMERS- VITON  
SPRINGS- HAST C

NOTES:

REFERENCE SK1070 FOR  
INSTALLATION/ ASSEMBLY  
INSTRUCTIONS

		P.O. BOX 184 / 1 JACKSON ST. ESSEX JUNCTION, VT 05453 (802) 878-8307	
SEAL CODE: 3285X03C2VS2			
JOB#: S006905			
SCALE: NONE	DRAWN BY: JK	DATE: 10/24/13	
STYLE 85X FULLY SPLIT CARTRIDGE SEAL WITH SLOT EXTENSION TABS FOR TWO BOLTS			SIZE 2"
DWG.#: FS56445			REV.



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years







# Flex-A-Seal



## FLEX-A-SEAL COVERAGE OF AB PLANTS:

AB PLANT LOCATION:	AB CONTACT:	FAS CONTACT / REP:	NOTES:
Baldwinsville, NY		FAS hqtrs. / Tyler Sadler	
Cartersville, GA		Roger Sorel	
Columbus, OH		Paul F. / TE	
Fairfield, CA		Alex Slauson / Matt Jensen	
Fort Collins, CO		Max M. / SE	
Houston, TX		Doug Strahm / Skip Kretschmar	
Jacksonville, FL		Roger Sorel	
Los Angeles, CA		Matt Jensen	
Merrimack, NH		FAS hqtrs / Tyler Sadler	
Newark, NJ		Tyler Sadler	
St Louis, MO		E Pro / Alex Slauson	
Williamsburg, VA		Roger Sorel	

## HOW CAN WE HELP?



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



## REFERENCES:

### STYLE 85 SPLIT CARTRIDGE SEALS

09/15/2014

DWG #	FAS Code	Equipment Manufacturer	Model / Size	End User	Location	Product
FS51057	10485X03C2VS2	GOULDS	MFD 30X30-27125 Vertical SN34736	Metropolitan Sewerage	Asheville, NC	DIRTY WATER
FS52664	248503C2VS2	GOULDS	Vertical Turbine	AESETCO STEEL	AL	DIRTY WATER
FS52664M11	248503C2VZ2	GOULDS	Vertical Turbine	AESETCO STEEL	AL	DIRTY WATER
FS50454	448503C2VS2	-----	-----	Durham Region WWTP	Ontario, Canada	WASTE WATER
FS50458	5285	ALLIS CHAMERS	MODEL 200 NSWV	George's Creek WWTP	Westernport, MD	SEWAGE
FS50460M32	568503S2VS2	JOHNSTON	24DC	CONDO ELECTRIC	Hialeah, FL	WASTE WATER
FS52687	40MM85X03C2VS2	JAPROTEK	Top Mounted Agitator GS04-AG5 4850 2344/96	WASTER WATER TREATMENT PLANT	-----	BIOLOGICAL SLURRY



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



## REFERENCES:

### STYLE 85 SPLIT CARTRIDGE SEALS

9/15/2014

Customer	Equipment	Application	Seal Size	Installed	Status	Contact
TVA Cumberland City, TN	ASH	Limestone Slurry	9.00"	2009	3 seals originally installed and still in service	Ken Parker
IP Courtland - Courtland, AL	Lightnin Agitator	Paper Stock	5.50"	2008	Ran leak free until this year when the mill was mothballed	Terry Honeycutt
IP Courtland - Courtland, AL	Beloit Jones RePulper	Paper Stock	6.75"	2010	Installed 4 seals all which ran leak free until mill was mothballed in 2014	Terry Honeycutt
IP Courtland - Courtland, AL	Goulds 3420	Paper Stock	7.50"	2013	Installed 2 seals on Split Case Goulds which ran leak free until mill was mothballed in 2014	Terry Honeycutt
Boise White Paper - Jackson, AL	Goulds 3175 L	Recycled Paper Stock	4.75"	2010	Installed in 2010 and still running leak free	Tony Batley
Boise White Paper - Jackson, AL	Goulds 3175 M	Recycled Paper Stock	3.75"	2010	Installed in 2010 and still running leak free	Tony Batley
Boise White Paper - Jackson, AL	Goulds 3175 S	Recycled Paper Stock	3.00"	2010	Installed in 2010 and still running leak free	Tony Batley
Styrolutions - Decatur, AL	Agitators	Styrene Monomer Vapors	3.00"	2010	Installed 3 Seals still running leak free to date	Billy Brown
Fort Worth Water - Fort Worth, TX	Vertical Turbine Pump	City Water	1.687"	2013	Installed 1 seal, seal is leak free to date	Isaac Galavan
Corinth Water - Corinth, MS	Vertical Turbine River Water Intake Pumps	River Water	2.187"	2014	Installed first seal in May of 2014 and a second on a second pump in August 2014 - both are leak free	Bob Cooner



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



September 15, 2014

## STYLE 85 U.S. PATENTED SPLIT SEAL

### REFERENCES:

- ◆ **Melanie Adair**  
Purchasing / Office Assistant  
(801) 942-3674  
[adair@mwvdsls.org](mailto:adair@mwvdsls.org)  
Metropolitan Water District of Salt Lake and Sandy  
3430 Danish Road  
Cottonwood Heights, UT 84093
- ◆ **Clinton Johnson**  
General Supervisor / Process Maintenance  
(775) 468-4678  
[cjohnson@barrick.com](mailto:cjohnson@barrick.com)  
Barrick Gold North America, Inc.  
460 West 50 North, Suite 500  
Salt Lake City, UT 84101
- ◆ **Jeff Schena**  
Maintenance Supervisor  
(435) 864-6854  
[Jeff-schena@ipsc.com](mailto:Jeff-schena@ipsc.com)  
Intermountain Power Service  
850 W. Brush Wellman Road  
Delta, UT 84624-9546
- ◆ **Jim Mitchell**  
Planner  
(435) 864-6804  
Intermountain Power Service  
850 W. Brush Wellman Road  
Delta, UT 84624-9546

### INSTALLATION VIDEOS:

<http://www.youtube.com/watch?v=FPvFLAdSbr0>

<http://www.flexaseal.com/blog/>

ONE JACKSON ST., PO BOX 184, ESSEX JCT., VT 05453-0184 (802) 878-8307 1-800-426-3594 FAX (802) 878-2479

Email: [sales@flexaseal.com](mailto:sales@flexaseal.com)



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



## TESTIMONIAL:

Jeff,

*If you hadn't reminded me of all the Flex -a-Seal installs I would have forgotten. Since they were installed, we never had another issue with them, unlike the John Crane seal issues we had in the past before installing a Flex-A-Seal's split. But the four pulper locations were the installs that really shined. After numerous John Crane split seal repair kit install on the East reel pulper, and the number of dollars spent, your seal was a money saver, and most of all, it stopped the leakage of the stock. That's why we installed your seal in the other three pulpers. You know what a tough life a pulper goes through. But what else impressed me was the very high quality and the cost. I mean, we were buying a repair kit from John Crane which only included the seal faces and bellows with some super glue included for around \$ 600.00 less than your entire seal cost along with a throttle bushing included for the stuffing box. I do really appreciate the price and quality of your split seal. I absolutely hate a reliability issue. This was a real pain, I only wish we had them twenty years ago when this problem started. But enough said, the Gould's double suction pump you first installed the seal in, I had forgotten about it, once the two seals were installed, no more issues. That's the way I like it. Fix it and go on, not have to return to keep doing the same thing over again and again. That was the issue with the pulper, that is until we installed your Flex-A-Seal. Thanks Jeff, you're the Man, Seal man that is!!*

Thanks again,

Terry Honeycutt

Hexcel, Decatur, Alabama

256-340-4153



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years





# Flex-A-Seal



## 442C vs. FAS Style 85:

*To all FAS employees,*

*Reviewing this new Chesterton split seal design they have made several changes to address some of the inherent weak points of the 442 design. Their number one cause of the 442 failure is due to the difficulty of installing this seal on the pump. This is mainly due to the handling of the two primary seal faces as well as all of the O-Rings as shown in the 24 steps required in the installation instructions. By addressing this issue of simplifying installation they are trying to achieve better seal reliability at start-up. This is great news for us since it validates what we have been saying about the 442 design.*

*The new 442C has eliminated the ball and socket O-Rings and does require less handling of the two seal faces. Of the 10 features and benefits only two are new: Interlocking Face Alignment and Spring lifter. According to the new installation instructions there are 10 steps needed to prepare the seal for installation, then 16 more steps to install the seal on the pump. There is less handling of the faces but the lapped faces are still exposed to dirt, grease, debris, etc. (they even supply a wipe to clean them) and there is still the potential handling damage. The 442C is better but is still more complicated to install when compared to our Style 85 (5) steps.*

*This new design is still defined as a component mechanical seal since it has (4) pc that have to be assembled on the pump, the set screws lock the rotary seal ring assembly to the shaft which can't be reached after the (2) stationary gland assemblies have been bolted together. So it is impossible to make any impeller adjustments the way a true cartridge mechanical seal (as the seal industry defines) can do. Another important point since the 442C is a true component seal it cannot be pressure tested at the factory like the Style 85. So Chesterton is still having the end user to be responsible to verify that this complicated seal with precision lapped faces is assembled correctly on the pump.*

*It was also interesting to note that the "easy field repair" of this seal now requires 38 steps to get it ready to install.*

Kim



Fluid Sealing "Solution Providers"  
Worldwide for 30 Years

