



The Next Generation of Shaft Sealing



CINCHSEAL ROTARY SHAFT SEALS FOR CHEMICAL APPLICATIONS

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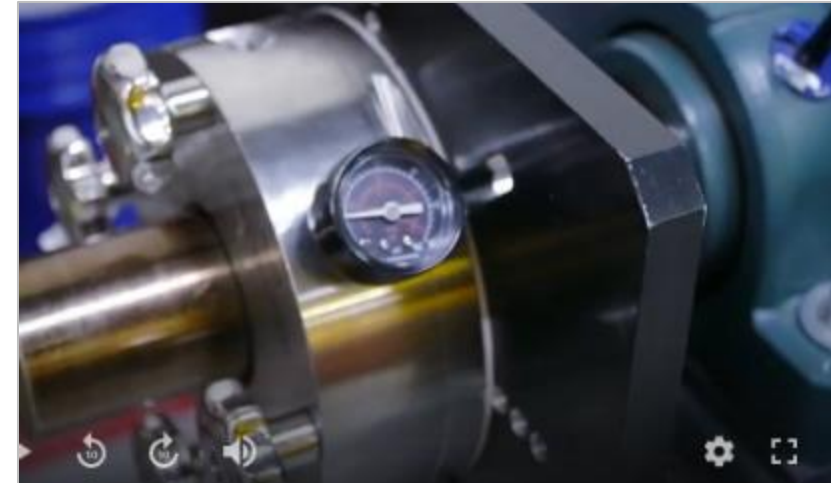
 www.cinchseal.com



The Next Generation of Shaft Sealing

CINCHSEAL OVERVIEW VIDEO

- **Leading manufacturer of rotary shaft seals:**
 - Patented, unique, problem-solving seals
 - Used with screw conveyors, mixers, blenders, and other bulk-handling equipment
 - Seals in slurries, powders and semi-liquids
- **Industries:** food processing, chocolate, bakery, pulp & paper, feed & grain, industrial, chemical, pharmaceutical, goldmine, battery, and others
- **Over 25 years in business**
 - Current Customer Base: < 4000 customers in < 50 countries
 - Located in Mount Laurel, NJ
- **Used by 2/3 of world's top food and major companies in every processing industry**
 - Standard seals for common equipment types
 - Custom seals designed for specific customers, equipment types, materials and applications





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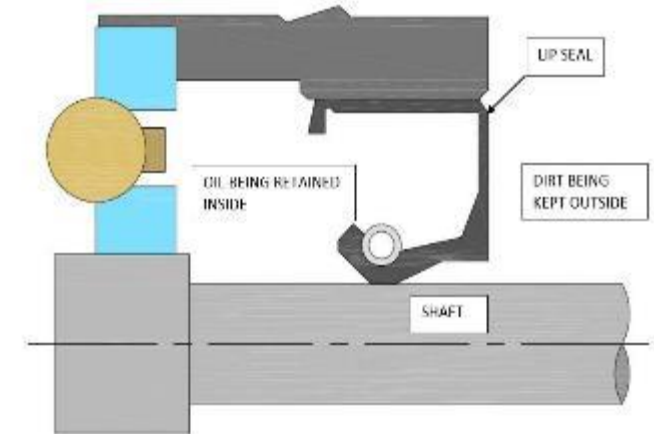
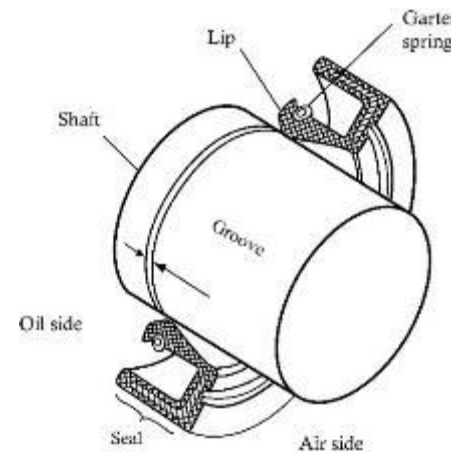
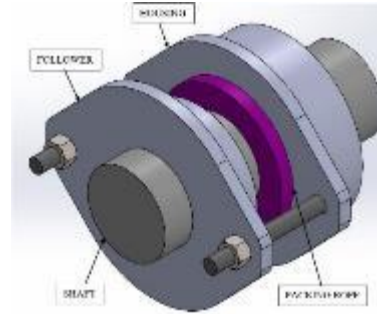
LIP & PACKING SEALS (WATCH A VIDEO)

Advantages

- Low-cost alternative
- Have been around for a long time

Disadvantages

- Unable to handle shaft run-outs
- Do not rotate with the shaft
- Allow product leakage
- Facilitate product loss
- Expensive to maintain
- Cause shaft damage
- Enable bearing failure
- Difficult to hygienically clean
- Require long installation
- Product contamination and recall risk





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CINCHSEAL VALUE PROPOSITION

Reduce Waste	<ul style="list-style-type: none">▪ Stop process equipment from leaking valuable product▪ Generate savings on material loss and clean-up costs
Lower Maintenance	<ul style="list-style-type: none">▪ Designed to handle up to ¼" [6.35mm] shaft run-out without losing a seal on the shaft▪ Protect gearboxes, bearings and shafts from damage
Ease of Installation and Hygienic Cleaning	<ul style="list-style-type: none">▪ No need to remove bearings or drive units and do mechanical adjustments due to innovative split design▪ Easily assemble/disassemble for wash-downs between batches
Increase Productivity	<ul style="list-style-type: none">▪ Longer functional life than traditional lip or packing seals▪ Avoid unplanned production downtime
Risk Management	<ul style="list-style-type: none">▪ Prevent product recalls, cross-contamination, and foreign material migration▪ USDA- and FDA-certified sealing products



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FEATURES & BENEFITS

CinchSeal's Clean-In-Place (known as CIP) seals are run-out tolerant rotary shaft seals that make the need for processing equipment replacement far less likely as they solve problems associated with traditional lip seals and mechanical packing.

One-year ROI of up to 10x – 35x

Features

Rotating Drive Elastomer and Rotors Design

Tolerance for up to 0.250" [6.35mm] Shaft Dynamic Run-out

Self-Adjusting, Abrasion-Resistant Sealing

All C.E.M.A. Standard and Metric Sizes

Innovative Split CIP Design

FDA-Certified Rebuild Kits

Custom-Tailored to Any Machinery

Available USDA-Certified Models for Dairy, Meat, and Poultry Applications

Benefits

Protects bearings, gearboxes, and shafts from damage

Prevents cross-contamination, foreign material migration, product leakage and recalls

Eliminates unscheduled downtime, maintenance, and lost productivity

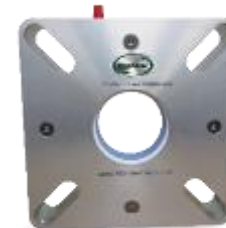
Designed for C.E.M.A. standard and metric screw conveyor and bulk-handling equipment

- Requires no removal of bearings or drive units
- Allows for hygienic cleaning between batches
- Enables easy installation and maintenance

Reduces the total cost of ownership, replacing soft internal components, without compromising the seal

With custom drawings, perfectly fits on any standard or non-standard new and existing equipment

Provides a hygienic sealing solution for highly regulated industries





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OUR CHEMICALS CUSTOMERS

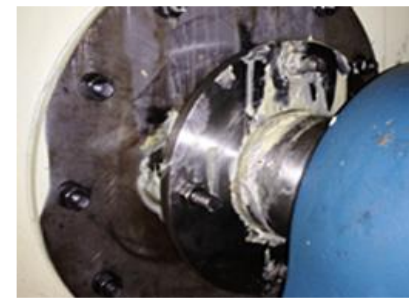
- Arkema
- BASF
- 3 M
- Chemours (Dupont)
- Clorox
- Ecolab
- Exxon Mobile Chemical
- FMC Chemical
- Honeywell
- Henkel Technologies





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LEAKING CHEMICALS EXAMPLES

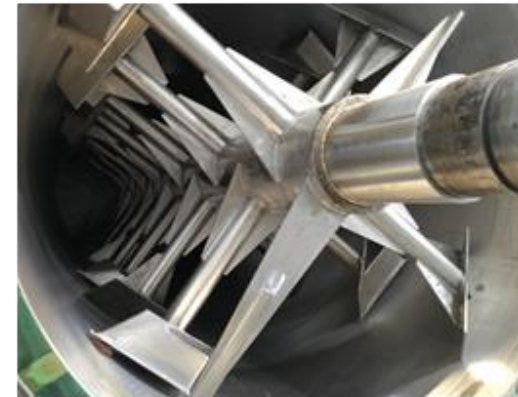




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CHEMICAL EQUIPMENT

- **Screw Conveyors
(Horizontal and Incline)**
- **Extruders**
- **Driers**
- **Paddle Mixers**
- **Ribbon Blenders**
- **Rotary Airlocks**





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CHEMICAL ROI

ISSUE

- At a national titanium dioxide manufacturing company, the rotary air locks in the packing area were leaking 1,000 lbs. of titanium dioxide per week, totaling 26 tons of wasted product per year.
- Aside from the high costs associated with the wasted product, the customer also had to dispose of this product and the maintenance team was devoting 10 hours of their work week to leak prevention.
- **The estimated costs associated with these leaks was \$50,000 annually.**

SOLUTION

- They decided to buy a custom-designed 3" CinchSeal stainless steel seal. The leakage and housekeeping issues were eliminated.
- The customer was so happy with the results that they purchased CinchSeals for their screw conveyor application and then replaced the packings on their Star Rotary Air Valves used on the finishing side.

CINCHSEAL CONVERSIONS

BEFORE



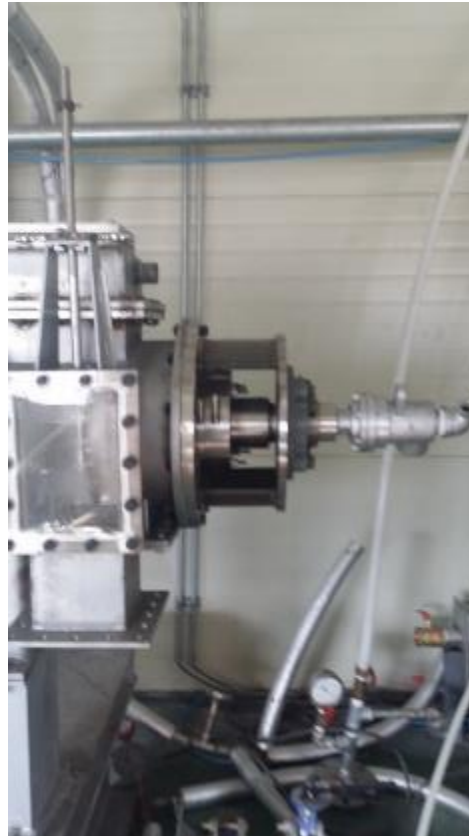
AFTER





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CHEMICAL PLANTS





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APPLICATIONS

	<ul style="list-style-type: none">• TiO₂• Salt/Sugar• Plastics• Variety of Powders	Rotary Air Lock Seal 		<ul style="list-style-type: none">• Cement and Gypsum• Metal Powders• Grain and Ethanol• Sugar• Mining	7550 
	<ul style="list-style-type: none">• Bakery• Bread• Cookies• Crackers	9700 		<ul style="list-style-type: none">• Lime• Chemical Processing• Salt• Spices• Rendering	7800 
	<ul style="list-style-type: none">• Meat Processing• Poultry• Meat Rendering	9100 		<ul style="list-style-type: none">• Food Processing• Spices & Flavorings• Cheese & Dairy• Pet Foods• Chemical Processing• Chocolate	9700 



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CHEMICAL APPLICATIONS

- Safety, reliability, product disposal of leaked and toxic product are major concerns
- Key applications are screw conveyors, extruders, driers, rotary air locks, mixers and blenders.
- Typical applications include low to high viscosity mixing, dry blending, particle size reduction, emulsification, homogenization, powder induction, vacuum processing and more.

TITANIUM TECHNOLOGIES

- Production of TiO_2 for coatings, plastics, and laminates

FLUOROPOLYMERS AND FLUOROCHEMICALS

- Fluoropolymers help boost reception for smartphone antennae, stretch maintenance levels for heavy machinery, and protect circuits and engines from heat.

CHEMICAL SOLUTIONS

- Industrial chemicals
- Sodium cyanide for mining
- Glycolic acid for boilers
- Potassium cyanide for metal plating
- Chemical initiators
- Dimethyl sulfate



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CHEMICAL APPLICATIONS



- **Abrasives** - products developed to shape and finish surfaces in various applications including woodworking, autobody painting & repair, construction, personal products, etc. Typically, materials used as abrasives are either hard minerals (rated at 7 or above on Mohs scale of mineral hardness) or synthetic stones. Softer minerals like calcium carbonate are used as abrasives, such as "polishing agents" in toothpaste.
- **Blenders** mix, coat or vacuum dry abrasive powders.
- **Polymers** - Processing of engineering polymers requires high pressure and temperature, tightly sealed mixer/reactor vessels highly resistant to chemical degradation, jackets for optimum heat transfer, and clog-free discharge systems.
- **Chlorinated Organics** - Key ingredients in a wide variety of end products, including paints and coatings, adhesives, pharmaceuticals, aerosols, dry-cleaning agents, degreasing solvents, etc.
- **Mixers** offload chlorinated hydrocarbon slurry from railcars and trucks. During transport, some solids settle and agglomerate. The slurry is fed at 10 to 30 gpm to reactors that operate with 1/4" nozzles. In the past they used centrifugal pumps to offload this slurry.
- **Horizontal Inline High Shear Mixers** are used. Agglomerates that can potentially clog the reactor nozzles are broken down as they pass through the rotor/stator interface.



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CHEMICAL APPLICATIONS



- **Coal Suspensions** - In the processing of synfuel, powdered coal is combined with oil that is fed into the furnaces of large power plants.
- **Inline High Shear Mixers** have been proven very effective in this area. Also, vacuum Double Planetary Mixers are ideal for drying coal and recovering solvents. The dried coal is used for making fire-resistant insulation boards and ablative coatings on aircrafts.
- **Epoxy Hardeners** - The building blocks of epoxy adhesives: epoxy resins, hardeners, accelerators, fillers and additives. Cure is generally achieved using hardeners (co-polymerization).
- **Flotation Reagents** - Flocculants are chemicals that are specifically designed to form agglomerations, usually in an aqueous medium, such as wastewater.
- **Lubricant Pastes and Oils** - A manufacturer of oil-based lubricating grease is using asphaltic oil, to which they add organic acids and aluminum isopropoxide powder to thicken the oil into a grease product. Large turbine-agitated vessels are utilized to make this product. However, the addition of AIP, which is a dusty solid, creates an environmental issue.



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CHEMICAL APPLICATIONS



- **Precious Metals** - At some point in the manufacture of catalytic converters, a clean out is done when products are washed with water. Rinse water is recycled and stored due to the presence of precious metal residue. During storage, the metal particles settle.
- **Dispersers** agitate this soup, keeping the precious metals suspended and dispersed within the rinse water before it is sent to a drier. Metals recovery is critical because these catalysts are very expensive.
- **Propellants** - Mixers are widely used for making composite propellant pastes and slurries made from solid oxidizers such as ammonium perchlorate or ammonium nitrate, powdered metal fuel such as aluminum, rubber, cellulose, epoxy, and/or other fuel/binder compounds.
- **PVB Emulsions** - aqueous polyvinylbutyral dispersions are used as decorative, protective or temporary coatings for paper, metal, wood or glass. A sample blend consists of viscous oil plasticizer, surfactant and powdered PVB polymer resin.
- **Kneader Extruders and Planetary Mixers** are suitable equipment for this application.

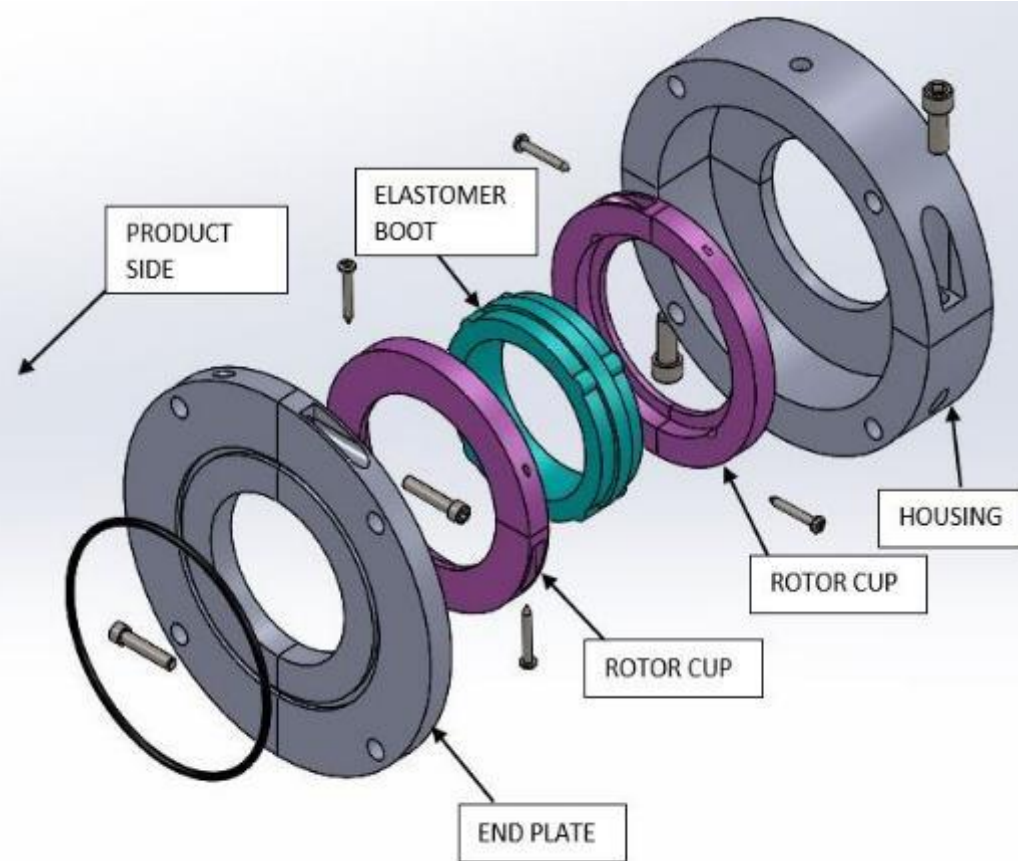


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CINCHSEAL ASSEMBLY

5 PARTS:

- Metal End Plate
- Metal Housing
- Elastomer Boot
- 2 PTFE Rotor Cups





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1). SILICON ELASTOMER

- The elastomer boot grips and seals the shaft without damaging or wearing the shaft. It drives the wearable PTFE seal faces
- The 425 °F-tolerant elastomer is made from a "FDA-approved" silicone that handles 95% of industrial applications in the field
- It can be made from VITON, AFLAS and EPDM for harsher chemicals

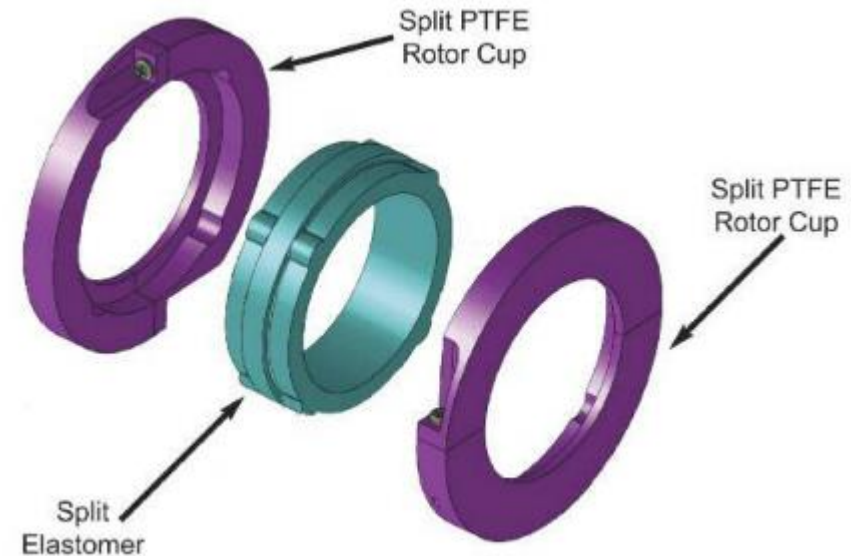
2). PTFE ROTOR CUPS

- The PTFE stators and rotor cups are made from a mineral-filled PTFE
- Depending on the shaft rotating speeds, the PTFE can be blended with minerals to reduce the friction coefficient at the PTFE-metal interface
- The rotor cups are also FDA approved for indirect food contact

3). METAL PARTS

- Seal housings and end plates are available in aluminum, polypropylene, and 304ss or 316ss, depending on application requirements

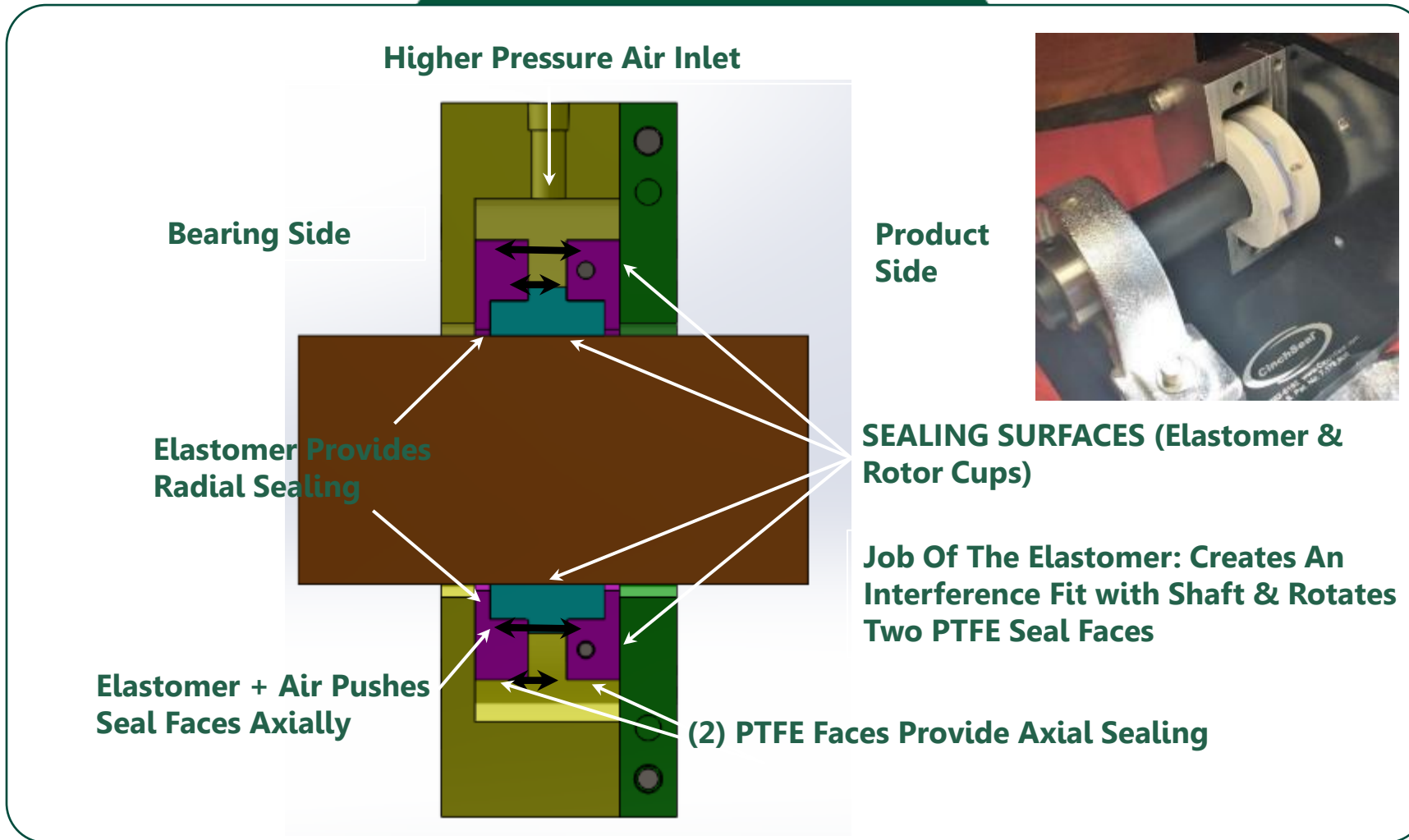
HOW TO ASSEMBLE AND DISASSEMBLE CINCHSEAL





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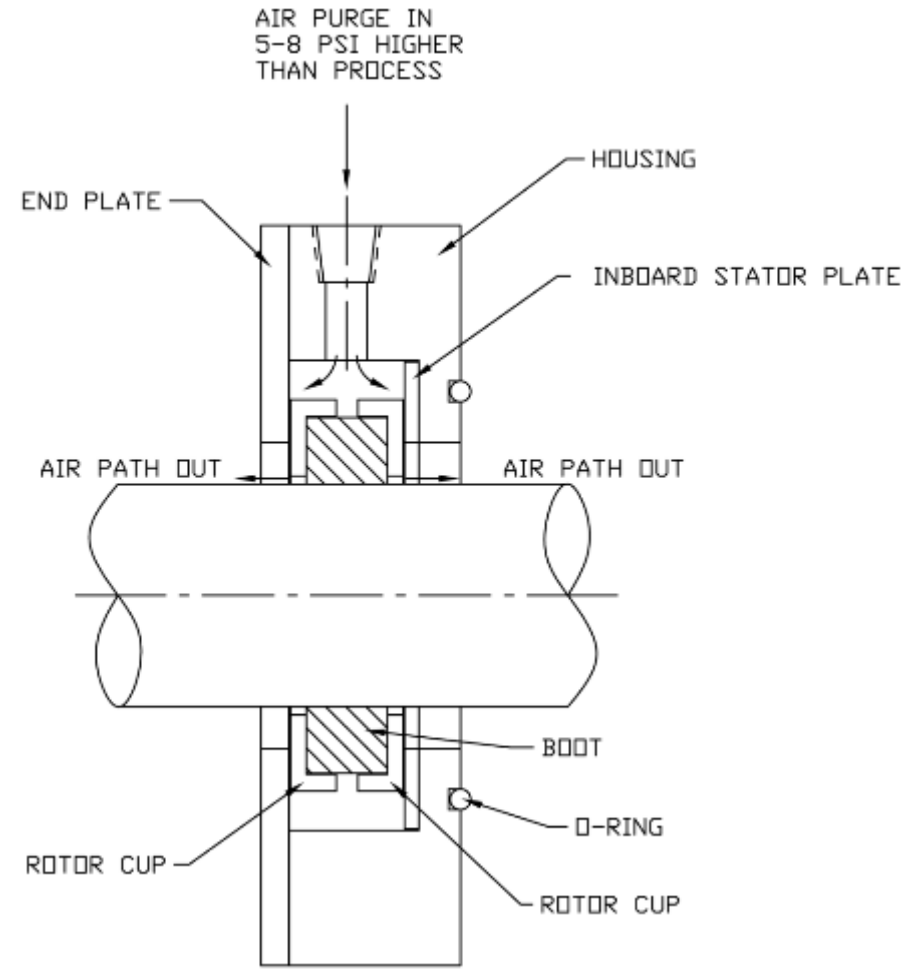
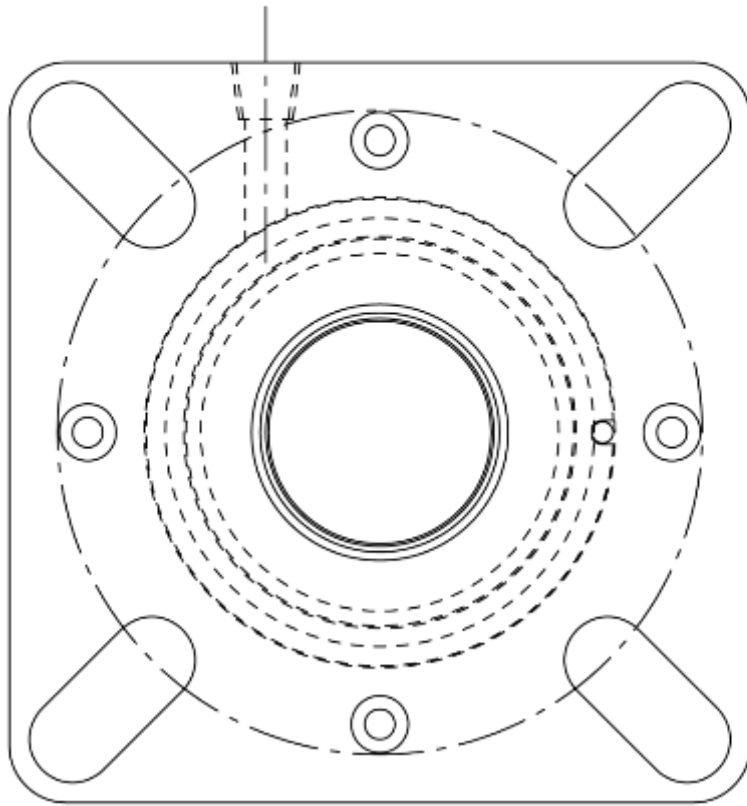
SEAL CROSS-SECTION





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AIR PURGING





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WHY WE AIR PURGE THE SEALS



Creates a higher pressure in the seal chamber to form a natural air barrier that keeps product out of the seal



Develops a force that pushes the rotating faces outward against the stationary faces and creates a tighter seal



Cools the rotating seal faces by reducing temperature caused by friction



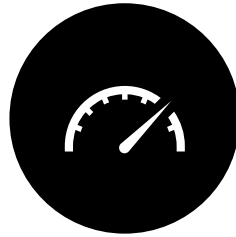


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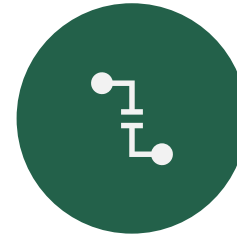
SPECIFICATIONS



Silicon And PTFE Internal Parts Are Good Up To 425 °F - Higher Temperature Applications Are Possible



- Up To 28" Of Vacuum
- Up To 45 Psi Operating Pressure
- Purge Seal With 5 To 7 Psi Of Air Above Operating Vessel Pressure For Optimum Performance



Typical Flow Rate Is Less Than 1 CFM With Air Regulator Set At 5 Psi



Maximum Surface Speed - Approximately 270 Ft/Min (5" Shaft @ 200 Rpm, Some Applications Run Up To 400 Rpm)



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HOW TO INSTALL THE SEAL VIDEO





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WHY SWITCH TO CINCHSEAL – WATCH A VIDEO



Cost Savings: Eliminates product waste, unscheduled maintenance costs and downtime, premature bearing failure, shaft damage, and reduces energy consumption



No Damage to Shafts: CinchSeal's unique design protects rotating shafts from being scored or damaged



Run-out: Can handle up to ¼" [6.35mm] shaft run-out without losing a seal on a shaft



Health and Safety: Prevents powder and dust leakages that can cause hazardous work environments and explosions



Clean-In-Place Design: Allows for hygienic clean-up between product batches



Proven ROI: One-year ROI of up to 10x – 35x