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MECHANICAL SEALS, PACKING, GASKETS, AND HOSES

- **MECHANICAL SEALS** Single, double & tandem cartridge seals, metal bellow seals, high temperature seals, single spring seals. Tungsten and Silicone Carbide stationary seats. Custom designed and engineered seals.
- **MECHANICAL SEAL REPAIR** Complete repair facility; lapping, grinding, and ceramic departments. Complete repair of major brands including John Crane, Flowserve, Durametallic, Borg Warner and Burgmann. Parts manufactured to OEM specifications.
- **MECHANICAL PACKINGS** Centrifugal pump packing, reciprocating pump packing, valve packing, die formed graphite seats.
- **GASKETS, SHEET MATERIALS** Asbestos and Non-Asbestos compressed sheet, diaphragm sheet, vegetable fiber, and Teflon sheet. EPDM, viton, food grade, silicone, neoprene, super neoprene, aflas, buna, gum, red rubber sheet, kalrez, and chemraz. Open and Closed cell sponge.
- **SPIRAL WOUND GASKETS** Flange, heat exchanger, boiler, and metallic jacketed gaskets.
- **INDUSTRIAL HOSES** Vent, exhaust, utility blower, air, water, nitrogen, steam tank truck, and chemical hose.
- **METAL & TEFLON HOSE** 304ss, 316ss, and 321ss hose, Teflon lined, smooth bore hose.
- **RESERVOIRS** Seal Pots, and Plan 65 Reservoir.
- **EXPANSION JOINTS** EZ flow, guardian, rubber and metal expansion gaskets.
- **INDUSTRIAL FLUIDS** Food grade accessories, cleaners and degreasers, lubricants, metal working fluids, rust preventatives, and Barrier fluids.

“SERVICE FIRST”
“WE AIM TO PLEASE”

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- BAKER PETROLITE
- CELANESE LTD
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- GEO SPECIALTY CHEMICALS
- ISP TECHNOLOGIES INC
- LYONDELL-EQUISTAR
- PILOT CHEMICAL
- PPG INDUSTRIES
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PIPELINE COMPANIES

- BJ PROCESS AND PIPELINE
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- ENERGY TRANSFER
- ENTERPRISE PRODUCTS
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- MAGELLAN PIPELINE
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- WILLIAMS PIPELINE
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MUNICIPALITIES

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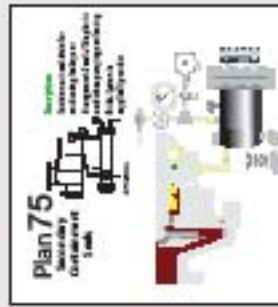
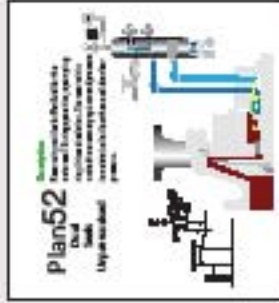


CHAMPION GROUP, INC.

Champion 500 Series of Substations
174 SERIES, LOW VOLTAGE
2013, 2014, 2015, 2016
2017, 2018, 2019, 2020, 2021, 2022

Champion 600 Series of Substations
176 SERIES, MEDIUM VOLTAGE
2013, 2014, 2015, 2016
2017, 2018, 2019, 2020, 2021, 2022

Champion 800 Series of Substations
178 SERIES, MEDIUM VOLTAGE
2013, 2014, 2015, 2016
2017, 2018, 2019, 2020, 2021, 2022



Piping Key

Off-line

Back Valve

Check Valve

Pumping Station

Remote Control Valve

Control Valve

Cycle Valve

Valve

Inlet Valve

Outlet Valve

Flange

Accessory

Lead Sheet Low

Lead Sheet High

Pressure Switch Low

Pressure Switch High

Flow Indicator

Flow Meter

Pressure Indicator

Temperature Indicator

Air Line

Condensate Valve

CHAMPION STYLE 301 BALANCED PUSHER SEAL

The CHAMPION 301 seal is a reliable, integrally balanced field proven seal. It has demonstrated superior performance in side by side tests with conventional seal designs. The modular design is easily installed without fear of damaging the dynamic O-ring.



TECHNICAL DATA

Materials of Construction:

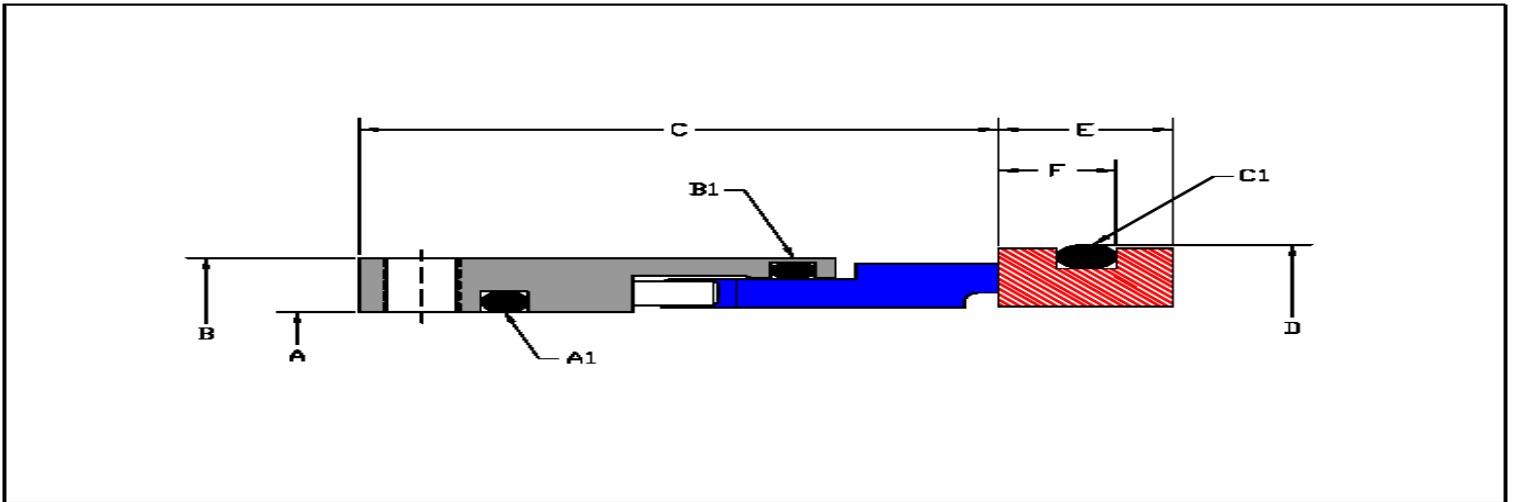
- Retainer and drive pins - 316SS
- Springs - Hastelloy C
- Set Screws - 316ss
Available in Hastelloy C
- O-rings - Client Requirements
- Rotating Seal Face - Carbon - Graphite - Resin
Resin Purebon 658 R.C.
Other face material upon request
- Stationary Face - Tungsten Carbide
- Sintered Silicon Carbide

Operating Conditions:

Seal Surface Speeds to 80 F.P.S.
Pressures to 450 P.S.I.G.
Temperatures to: Viton O-ring 400°F
Kalrez O-ring 550°F

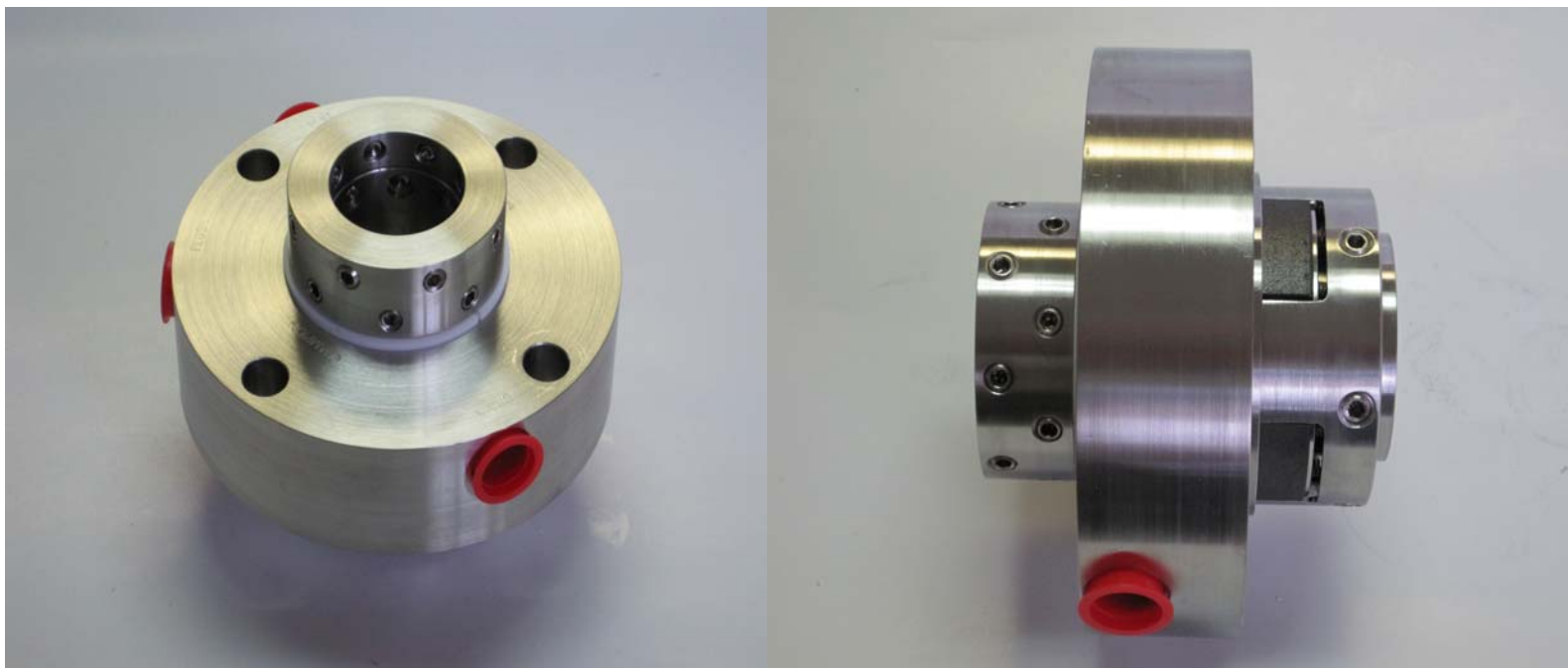
Trademarks and Proprietors:

Hastelloy	Cabot Corporation
Viton, Kalrez	E.I Dupont Numeours & Co
Chemraz	Green Tweed



SEAL SIZE	DIA. A	SEAL O.D. B	LENGTH C	SEAT O.D. D	LENGTH E	STEP F	ORING A1	ORING B1	ORING C1
15/16"	.937	1.500	1.750	1.547	.500	.375	2-119	2-124	2-119
1"	1.000	1.562	1.750	1.609	.500	.375	2-120	2-125	2-220
1-1/8"	1.125	1.687	1.750	1.734	.500	.375	2-122	2-127	2-222
1-1/4"	1.250	1.812	1.750	1.859	.500	.375	2-124	2-129	2-223
1-3/8"	1.375	1.937	1.750	1.985	.500	.375	2-126	2-131	2-224
1-1/2"	1.500	2.062	1.750	2.109	.500	.375	2-128	2-133	2-225
1-5/8"	1.625	2.250	1.750	2.359	.500	.375	2-130	2-136	2-227
1-3/4"	1.750	2.375	1.750	2.485	.500	.375	2-132	2-138	2-228
1-7/8"	1.875	2.500	1.750	2.609	.500	.375	2-134	2-140	2-229
2"	2.000	2.625	1.750	2.734	.500	.375	2-136	2-142	2-230
1-1/8"	2.125	2.750	1.750	2.985	.562	.406	2-138	2-144	2-232
2-1/4"	2.250	2.875	1.750	3.109	.562	.406	2-140	2-146	2-233
2-3/8"	2.375	3.000	1.750	3.234	.562	.406	2-142	2-148	2-234
2-1/2"	2.500	3.125	1.750	3.359	.562	.406	2-144	2-150	2-235
2-5/8"	2.625	3.250	1.750	3.359	.625	.437	2-146	2-151	2-235
2-3/4"	2.750	3.375	1.750	3.485	.625	.437	2-148	2-152	2-236
2-7/8"	2.875	3.500	1.750	3.734	.625	.437	2-150	2-153	2-238
3"	3.000	3.812	1.750	3.859	.750	.500	2-234	2-238	2-239
3-1/8"	3.125	3.937	1.750	3.985	.750	.500	2-235	2-239	2-240
3-1/4"	3.250	4.062	1.750	4.109	.750	.500	2-236	2-240	2-241
3-3/8"	3.375	4.187	1.750	4.234	.750	.500	2-237	2-241	2-242
3-1/2"	3.500	4.312	1.750	4.359	.750	.500	2-238	2-242	2-243
3-5/8"	3.625	4.437	1.750	4.485	.750	.500	2-239	2-243	2-244
3-3/4"	3.750	4.562	1.750	4.609	.750	.500	2-240	2-244	2-245
3-7/8"	3.875	4.687	1.750	4.734	.750	.500	2-241	2-245	2-246
4"	4.000	4.812	1.750	4.859	.750	.500	2-242	2-246	2-247

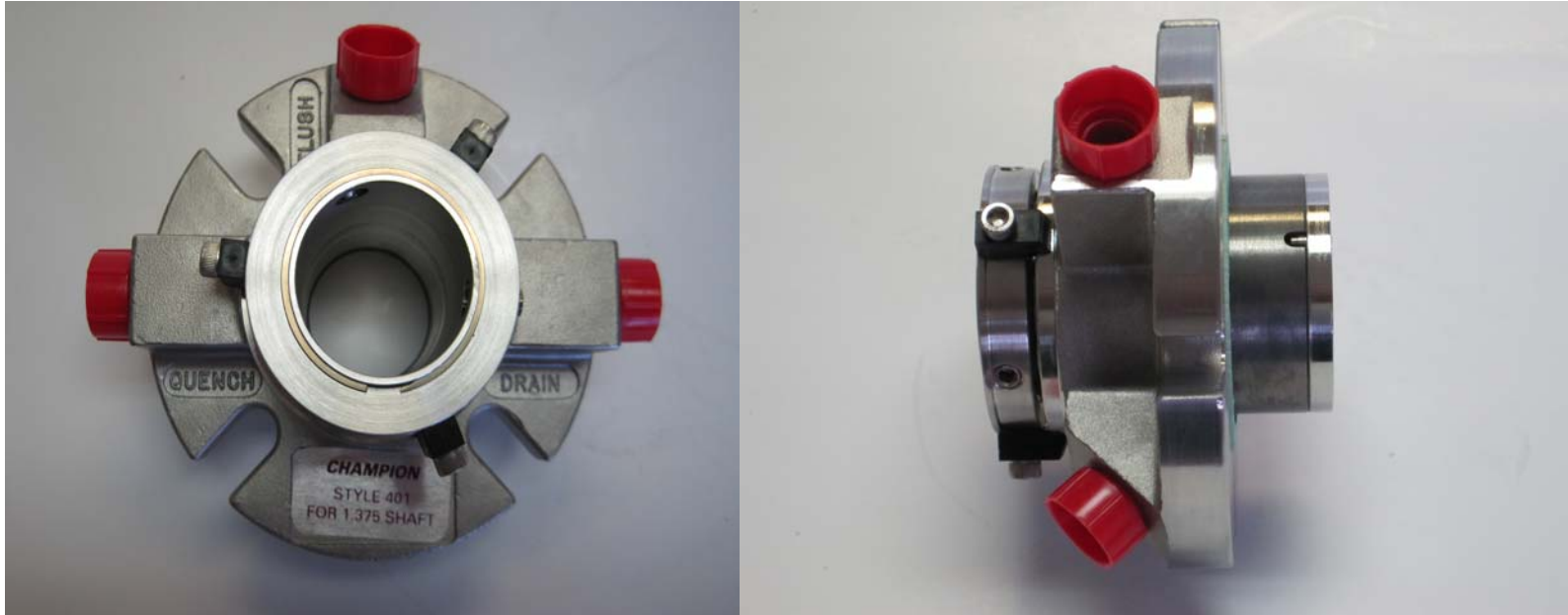
Champion 351 Single Cartridge Seal



The Champion style 351 Single Cartridge Seal is engineered especially for high pressure applications. The Champion Style 351 is designed to contain the sealed fluid effectively and safely, while ensuring a long seal life. This is accomplished with the use of several design technologies.

The technological advancements are built into the seal components that do not distort under high pressure. (Seal leakage is the result of excessive seal face deformation.) maintaining the best service from the seal. The seal gland has two important features to help accomplish this task. Multi-port injection ensures symmetrical face cooling and avoids erosion or deformation problems associated with high circulation rates at a high pressure. Swirl brakes enhance the fluid supplied to the faces. A close clearance bushing contains the quench medium or any product leakage.

Champion 401 Cartridge Seal



The 401 Modular Design Single Cartridge Seal is an exclusive design manufactured by Champion Hi Tech. This design is a result of many years of seal engineering and plant operating experience by our Engineering Design Team. Only field proven design features were good enough to be incorporated into the 401 seal. These successful design features are the secret of the Superior Design of the CHAMPION 401 SEAL. The CHAMPION “Quality Assurance and Testing Program” guarantees the finest seal available anywhere.

- **SLIMLINE CARTRIDGE DESIGN**

The Champion 401 is designed to fit ANSI standard dimension pumps without stuffing box modifications.

- **ROBUST MODULAR CONSTRUCTION**

Integral sleeve design assures rotating seal face alignment. Therefore, this design does not require a welded retaining cup. Dual snap rings provide precise drive collar alignment. The style 401 brass gland disaster bushing is snap ring retained to allow easy replacement. The gland module contains the spring mounted stationary face, flush, quench, and drain ports as well the disaster bushing.

- **UNIVERSAL GLAND**

The radially slotted gland design on Champion Style 401 accommodates all ANSI standard bolt orientations. The flush, quench, and drain on Champion Style 401 meets API 610, paragraph 2.7.1.7., while the gland disaster bushing meets the 0.025 inch clearance as required by paragraph 2.7.1.12.

- **PREMIUM QUALITY SEAL FACE MATERIAL**

Sintered Alpha Silicon Carbide is the most corrosion resistant seal face material available; far superior to the R.B. Sic (reaction bonded silicon carbide) that most seal manufacturers use. Sintered Alpha Silicon Carbide is ideally suited for corrosive paper mill streams and hot caustic solutions (NaOH, KOH). Sintered Alpha Silicon Carbide is also finding widespread application in handling strong acids such as hydrofluoric (HF), hydrochloric (HCl), and sulfuric (H₂SO₄). In summary, Sintered Alpha Silicon Carbide with its superior hardness, thermal conductivity, low coefficient of friction and superior corrosion resistance will, in most applications, out perform tungsten carbide (WC), high purity ceramic (Al₂O₃), and R.B. Sic. The stationary face material is a high quality carbon graphite resin (CGR) compound. Other materials are available according to the application.

- **SPRINGS ISOLATED FROM PUMPED FLUID**

Dynamic O-ring location prevents the pumped fluid from contacting the springs; an important design criteria to prevent seal face hang up.

- **SPRING MOUNTED STATIONARY SEAL FACE**

The advanced design features of the stationary face and springs eliminates problems caused by angular pump shaft misalignment with respect to the stuffing box face. This run out can be as high as .020 inch without adversely affecting seal life.

- **AUTOMATIC CARTRIDGE ASSEMBLY CENTERING**

In the 401 design, the cartridge assembly is centered on the shaft, not the stuffing box I.D. as in some cartridge seals. The setting are made of a special plastic instead of metal, as a safety feature. This will eliminate a fire hazard in case the clips are not removed when the cartridge seal is installed.

- **I.D. RELIEVED SHAFT SLEEVE**

The CHAMPION 401 cartridge seal employs an I.D. relieved shaft sleeve. This is a necessary feature to allow easy removal from the pump shaft. Since many pump shafts are carbon steel, rust can form on the shaft preventing removal.

Technical Data: Materials of Construction

Gland and Hardware:

316SS is standard, other alloys are available

Springs:

Hastelloy "C" is standard

"O" rings:

Parker VITON is standard, other compounds are available.

Rotating Seal Face:

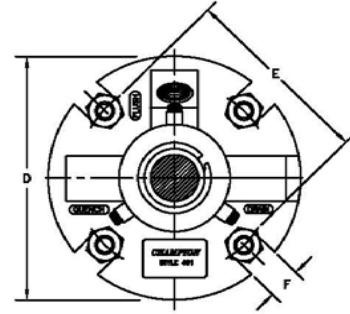
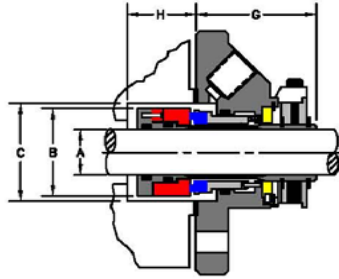
Tungsten Carbide
Sintered Alpha Silicone Carbide
Hi Purity Ceramic

Stationary Seal Face:

Carbon Graphite Resin
Tungsten Carbide
Sintered Alpha Silicone Carbide

Operating Conditions:

Seal surface speed up to 80ft per second
Pressures to 450 P.S.I.G.
Temperatures: 400F "Viton"
550F "Kalrez"



Seal Size	B	Stuffing Box Bore		D Max	E: Min Bolt Circle By Bolt Size				F	G	H - Min.
		C - Min	C - Max		B						
					3/8"	1/2"	5/8"	3/4"			
1"	1.562	1.625	1.750	4.125	2.750	-	-	-	.437	1.937	1.000
1-1/8"	1.687	1.750	1.875	4.250	2.875	-	-	-	.437	1.937	1.000
1-1/4"	1.812	1.875	2.000	4.375	3.625	-	-	-	.437	1.937	1.000
1-3/8"	1.937	2.000	2.125	4.500	3.250	-	-	-	.437	1.937	1.000
1-1/2"	2.062	2.125	2.250	5.000	3.375	-	-	-	.437	1.937	1.000
1-5/8"	2.250	2.375	2.500	5.250	3.500	3.625	-	-	.562	1.937	1.000
1-3/4"	2.375	2.500	2.625	5.500	3.625	3.750	-	-	.562	1.937	1.000
1-7/8"	2.500	2.625	2.750	5.500	3.750	3.875	-	-	.562	1.937	1.000
2"	2.625	2.750	3.000	5.450	4.000	4.125	-	-	.562	1.937	1.000
2-1/8"	2.750	2.875	3.125	6.000	4.250	4.375	4.500	-	.687	1.937	1.000
2-1/4"	2.875	3.000	3.250	6.250	4.375	4.500	4.625	-	.687	1.937	1.000
2-3/8"	3.000	3.125	3.375	6.250	4.500	4.625	4.750	-	.687	1.937	1.000
2-1/2"	3.125	3.250	3.500	6.500	4.625	4.750	4.875	-	.687	1.937	1.000
2-5/8"	3.250	3.375	3.625	7.625	-	5.437	5.562	-	.687	1.937	1.375
2-3/4"	3.625	3.750	4.000	7.750	-	5.562	5.687	-	.687	2.375	1.375
3"	3.875	4.000	4.250	8.000	-	5.812	5.937	-	.687	2.375	1.375
3-1/4"	4.125	4.250	4.500	8.250	-	6.062	6.187	-	.687	2.375	1.375
3-1/2"	4.375	4.500	4.750	8.500	-	6.312	6.437	6.562	.812	2.375	1.375
3-3/4"	4.625	4.750	5.000	8.750	-	6.562	6.687	6.812	.812	2.375	1.375
4"	4.875	5.000	5.250	9.000	-	6.812	6.937	7.062	.812	2.375	1.375

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WEBSITE - CHAMPIONSEALS.COM



The CHAMPION STYLE 402 is a cartridge design incorporating two seals in a face to face (inside/outside) configuration. The secondary seal is I.D. balanced so that it remains closed with the buffer fluid pressure. The primary seal (in-board) is balanced from both I.D. and O.D. so that it will accept pressure from the O.D. of the seal or the I.D. of the seal and still remain closed. Primary seal dual balanced is one of the necessary design requirements for successful high/low buffer fluid operation. These design features allow the CHAMPION 402 to be operated as if it were a double or tandem seal, thus permitting it be ideally suited for emission control applications.

- **SLIMLINE CARTRIDGE DESIGN**

The Champion 401 is designed to fit ANSI standard dimension pumps without stuffing box modifications.

- **ROBUST MODULAR CONSTRUCTION**

Integral sleeve design assures rotating seal face alignment. Therefore, this design does not require a welded retaining cup. Dual snap rings provide precise drive collar alignment. The style 401 brass gland disaster bushing is snap ring retained to allow easy replacement. The gland module contains the spring mounted stationary face, flush, quench, and drain ports as well the disaster bushing.

- **UNIVERSAL GLAND**

The radially slotted gland design on Champion Style 401 accommodates all ANSI standard bolt orientations. The flush, quench, and drain on Champion Style 401 meets API 610, paragraph 2.7.1.7., while the gland disaster bushing meets the 0.025 inch clearance as required by paragraph 2.7.1.12.

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Sintered Alpha Silicon Carbide is the most corrosion resistant seal face material available; far superior to the R.B. Sic (reaction bonded silicon carbide) that most seal manufacturers use. Sintered Alpha Silicon Carbide is ideally suited for corrosive paper mill streams and hot caustic solutions (NaOH, KOH). Sintered Alpha Silicon Carbide is also finding widespread application in handling strong acids such as hydrofluoric (HF), hydrochloric (HCl), and sulfuric (H₂SO₄). In summary, Sintered Alpha Silicon Carbide with its superior hardness, thermal conductivity, low coefficient of friction and superior corrosion resistance will, in most applications, out perform tungsten carbide (WC), high purity ceramic (Al₂O₃), and R.B. Sic. The stationary face material is a high quality carbon graphite resin (CGR) compound. Other materials are available according to the application.

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- **I.D. RELIEVED SHAFT SLEEVE**

The CHAMPION 401 cartridge seal employs an I.D. relieved shaft sleeve. This is a necessary feature to allow easy removal from the pump shaft. Since many pump shafts are carbon steel, rust can form on the shaft preventing removal.

carbon graphite resin (CGR) compound. Other materials are available according to the application.

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Gland and Hardware:

316SS is standard, other alloys are available

Springs:

Hastelloy "C" is standard

"O" rings:

Parker VITON is standard, other compounds are available.

Rotating Seal Face:

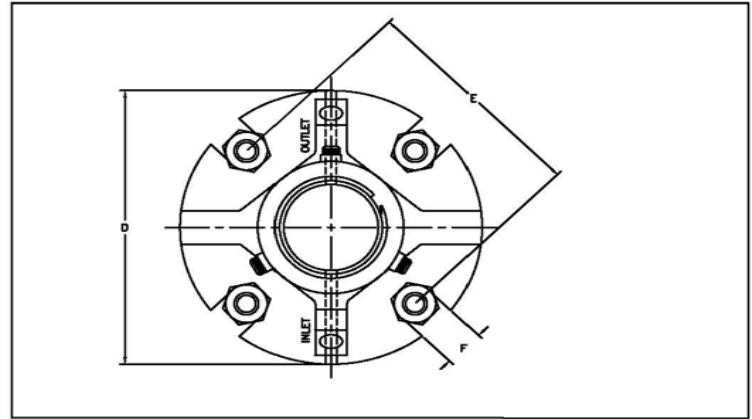
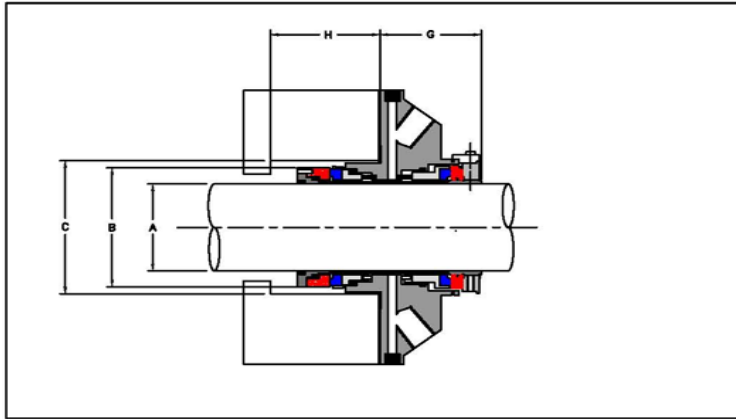
Tungsten Carbide
Sintered Alpha Silicone Carbide
Hi Purity Ceramic

Stationary Seal Face:

Carbon Graphite Resin
Tungsten Carbide
Sintered Alpha Silicone Carbide

Operating Conditions:

Seal surface speed up to 80ft per second
Pressures to 450 P.S.I.G.
Temperatures: 400F "Viton"
550F "Kalrez"



Seal Size	B	Stuffing Box Bore		D	E: Min Bolt Circle By Bolt Size				F	G	H - Min
		C Min	C Max		3/8"	1/2"	5/8"	3/4"			
1"	1.562	1.625	1.750	4.125	2.750	-	-	-	.437	2.062	2.000
1-1/8"	1.687	1.750	1.875	4.250	2.875	-	-	-	.437	2.062	2.000
1-1/4"	1.812	1.875	2.000	4.375	3.625	-	-	-	.437	2.062	2.000
1-3/8"	1.937	2.000	2.125	4.500	3.250	-	-	-	.437	2.062	2.000
1-1/2"	2.062	2.125	2.250	5.000	3.375	-	-	-	.437	2.062	2.000
1-5/8"	2.250	2.375	2.500	5.250	3.500	3.625	-	-	.562	2.062	2.000
1-3/4"	2.375	2.500	2.625	5.500	3.625	3.750	-	-	.562	2.062	2.000
1-7/8"	2.500	2.625	2.750	5.500	3.750	3.875	-	-	.562	2.062	2.000
2"	2.625	2.750	3.000	5.450	4.000	4.125	-	-	.562	2.062	2.000
2-1/8"	2.750	2.875	3.125	6.000	4.250	4.375	4.500	-	.687	2.062	2.000
2-1/4"	2.875	3.000	3.250	6.250	4.375	4.500	4.625	-	.687	2.062	2.000
2-3/8"	3.000	3.125	3.375	6.250	4.500	4.625	4.750	-	.687	2.062	2.000
2-1/2"	3.125	3.250	3.500	6.500	4.625	4.750	4.875	-	.687	2.062	2.000
2-5/8"	3.250	3.375	3.625	7.625	-	5.437	5.562	-	.687	2.062	2.000
2-3/4"	3.625	3.750	4.000	7.750	-	5.562	5.687	-	.687	2.375	2.375
3"	3.875	4.000	4.250	8.000	-	5.812	5.937	-	.687	2.375	2.375
3-1/4"	4.125	4.250	4.500	8.250	-	6.062	6.187	-	.687	2.375	2.375
3-1/2"	4.375	4.500	4.750	8.500	-	6.312	6.437	6.562	.812	2.375	2.375
3-3/4"	4.625	4.750	5.000	8.750	-	6.562	6.687	6.812	.812	2.375	2.375
4"	4.875	5.000	5.250	9.000	-	6.812	6.937	7.062	.812	2.375	2.375

Optional Seal Sizes are Available Upon Request

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WEBSITE - CHAMPIONSEALS.COM

Champion 460 Tandem Cartridge Seal

351 INBOARD / 360 OUTBOARD



While it's possible to control emissions with a single seal provided that a number of restrictive conditions are met. "Real World" conditions make it difficult for single seals, even emission control single seals, to perform at moderately acceptable levels.

The 360 DRS is, therefore, designed to serve as the secondary seal when coupled with a primary liquid seal in tandem orientation. This design has found extensive applications in pipeline service where remote and unattended operating conditions are common. Other common applications include refinery and chemical plant service where rigid emissions control is mandatory.

351 (INBOARD)

The 351 is a heavy duty lug drive seal designed for use in multiple applications.

360 - Dry Running Contact Gas Seal (OUTBOARD)

The 360 was designed for a specific purpose.

To maintain low emission levels while, at the same time, eliminating the need for those complex and expensive wet tandem seal support systems that are currently used.

The 360 DRS does not require buffer fluid, reservoirs, pumping rings, or buffer fluid disposal systems. In many situations, level alarms are not necessary.

OPERATIONS

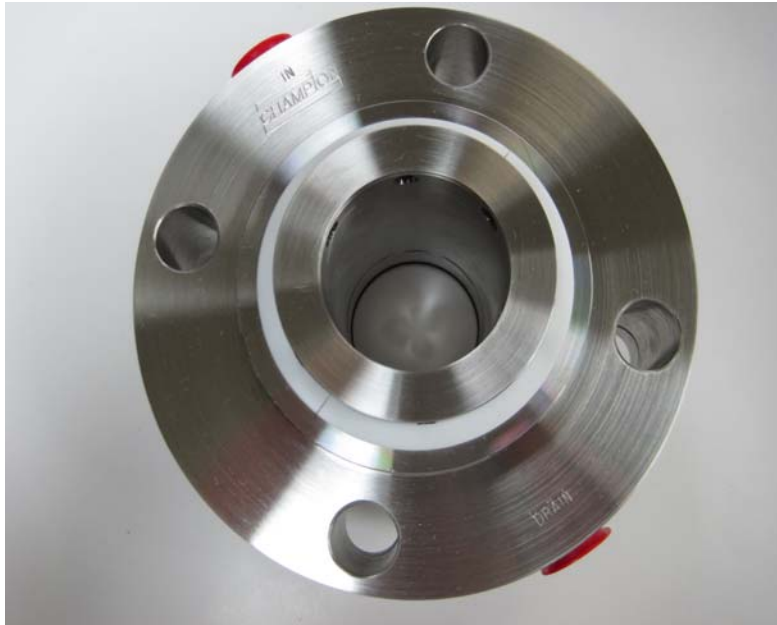
1. In normal operations, the 360 DRS sees only product fugitive emissions, as determined by the primary seal leak rate.
2. The 360 DRS will operate in continuous service in the 3-5 PSIG range, producing gland temperatures from 100-150F in ethane service. Continuous pressures above this level will accelerate carbon face wear.
3. In actual pipeline service, the 360 DRS has been subjected to pressures greater than 1000 PSIG of EP when the primary seal opened due to a system upset. Emissions were controlled and there was no damage to the 350 DRS. The period of upset lasted in excess of (6) hours before the pump was shut down.
4. Currently the seal has been successfully used in services from high pressure Co₂, E.P., 80/20 ethane/propane, to product pipelines handling gasoline, jet fuel, diesel, heating oil, crude oil, etc.
5. In remote E.P. service the secondary seal is connected to a vent stack, flare stack, or some type of flameless oxidizer with appropriate alarms.
6. In product pipeline service, the seals can be equipped with expellers and receivers to monitor seal liquids. The receivers are usually connected to a collection sump pump, and when needed, the receivers may employ level alarms.

OPERATING PERAMETERS

- Standard face surface velocity to 80FPS
- Fluid temperature limited to elastomers
- Fluid specific gravity is variable depending on a number of factors, but 0.040/0.045 is considered a minimum.
- Max. pressure - 2700 PSIG

Champion 471 Tandem Cartridge Seal

351 INBOARD / 351 OUTBOARD



While it's possible to control emissions with a single seal provided that a number of restrictive conditions are met. "Real World" conditions make it difficult for single seals, even emission control single seals, to perform at moderately acceptable levels.

The 351 DRS is, therefore, designed to serve as the secondary seal when coupled with a primary liquid seal in tandem orientation. This design has found extensive applications in pipeline service where remote and unattended operating conditions are common. Other common applications include refinery and chemical plant service where rigid emissions control is mandatory.

351 (INBOARD)

The 351 is a heavy duty lug drive seal designed for use in multiple applications.

351 - Dry Running Contact Gas Seal (OUTBOARD)

The 351 was designed for a specific purpose.

To maintain low emission levels while, at the same time, eliminating the need for those complex and expensive wet tandem seal support systems that are currently used.

The 351 DRS does not require buffer fluid, reservoirs, pumping rings, or buffer fluid disposal systems. In many situations, level alarms are not necessary.

OPERATIONS

1. In normal operations, the 351 DRS sees only product fugitive emissions, as determined by the primary seal leak rate.
2. The 351 DRS will operate in continuous service in the 3-5 PSIG range, producing gland temperatures from 100-150F in ethane service. Continuous pressures above this level will accelerate carbon face wear.
3. In actual pipeline service, the 351 DRS has been subjected to pressures greater than 1000 PSIG of EP when the primary seal opened due to a system upset. Emissions were controlled and there was no damage to the 350 DRS. The period of upset lasted in excess of (6) hours before the pump was shut down.
4. Currently the seal has been successfully used in services from high pressure Co₂, E.P., 80/20 ethane/propane, to product pipelines handling gasoline, jet fuel, diesel, heating oil, crude oil, etc.
5. In remote E.P. service the secondary seal is connected to a vent stack, flare stack, or some type of flameless oxidizer with appropriate alarms.
6. In product pipeline service, the seals can be equipped with expellers and receivers to monitor seal liquids. The receivers are usually connected to a collection sump pump, and when needed, the receivers may employ level alarms.

OPERATING PERAMETERS

- Standard face surface velocity to 80FPS
- Fluid temperature limited to elastomers
- Fluid specific gravity is variable depending on a number of factors, but 0.040/0.045 is considered a minimum.
- Max. pressure - 2700 PSIG

Champion 472 Tandem Cartridge Seal

351 INBOARD / 351 OUTBOARD



While it's possible to control emissions with a single seal provided that a number of restrictive conditions are met. "Real World" conditions make it difficult for single seals, even emission control single seals, to perform at moderately acceptable levels.

The 351 DRS is, therefore, designed to serve as the secondary seal when coupled with a primary liquid seal in tandem orientation. This design has found extensive applications in pipeline service where remote and unattended operating conditions are common. Other common applications include refinery and chemical plant service where rigid emissions control is mandatory.

351 (INBOARD)

The 351 is a heavy duty lug drive seal designed for use in multiple applications.

351 - Dry Running Contact Gas Seal (OUTBOARD)

The 351 was designed for a specific purpose.

To maintain low emission levels while, at the same time, eliminating the need for those complex and expensive wet tandem seal support systems that are currently used.

The 351 DRS does not require buffer fluid, reservoirs, pumping rings, or buffer fluid disposal systems. In many situations, level alarms are not necessary.

OPERATIONS

1. In normal operations, the 351 DRS sees only product fugitive emissions, as determined by the primary seal leak rate.
2. The 351 DRS will operate in continuous service in the 3-5 PSIG range, producing gland temperatures from 100-150F in ethane service. Continuous pressures above this level will accelerate carbon face wear.
3. In actual pipeline service, the 351 DRS has been subjected to pressures greater than 1000 PSIG of EP when the primary seal opened due to a system upset. Emissions were controlled and there was no damage to the 350 DRS. The period of upset lasted in excess of (6) hours before the pump was shut down.
4. Currently the seal has been successfully used in services from high pressure Co₂, E.P., 80/20 ethane/propane, to product pipelines handling gasoline, jet fuel, diesel, heating oil, crude oil, etc.
5. In remote E.P. service the secondary seal is connected to a vent stack, flare stack, or some type of flameless oxidizer with appropriate alarms.
6. In product pipeline service, the seals can be equipped with expellers and receivers to monitor seal liquids. The receivers are usually connected to a collection sump pump, and when needed, the receivers may employ level alarms.

OPERATING PERAMETERS

- Standard face surface velocity to 80FPS
- Fluid temperature limited to elastomers
- Fluid specific gravity is variable depending on a number of factors, but 0.040/0.045 is considered a minimum.
- Max. pressure - 3200 PSIG

CHAMPION STYLE 501 ROTARY ROTATING METAL BELLOWS SEAL

- NESTED RIPPLE DESIGN BELLOWS
- PRECISION TIG WELDED BELLOWS
- SELF CLEANING ROTATING BELLOWS
- BALANCED SEAL DESIGN
- NO SHAFT OR SLEEVE FRETING
- SIC STATIONARY FACE IS STANDARD
- SUPERIOR FACE TRACKING
- NARROW FACE DESIGN FOR SUPERIOR HEAT CONTROL
- SUPERIOR ROTATING FACE THERMAL STABILITY



The model 501-C metal bellows mechanical seal is designed to give greatly improved service life over pusher seals. Because they are rotating bellows, they are especially well suited for handling problem fluids such as drilling muds, and crude oil containing sand. In refineries they can handle oil streams containing FCC catalyst fines when both seal faces are properly designed. Because the standard bellows material is Hastelloy-c, the 501-C metal bellows seals will give excellent service in a corrosive environment that would damage common alloys such as 316ss, alloy 20, or AM 350.

TECHNICAL DATA

MATERIALS OF CONSTRUCTION:

Bellows Material:

- Hastelloy C - 276 (ASTM B-334) Standard on 501-C
- Alloys such as Hastelloy B are also available
- Other alloys available.

Set Screws:

- Hastelloy C set screws are standard

Rotating Face:

- Pure 658 RC carbon is standard
- Tungsten Carbide (Nickel Bound)
- Silicon Carbide (Hexoloy SA 80)

Stationary Face:

- Silicon Carbide (Hexoloy SA 80)
- O ring mounted is standard
- Tungsten Carbide (Nickel Bound)

O-rings:

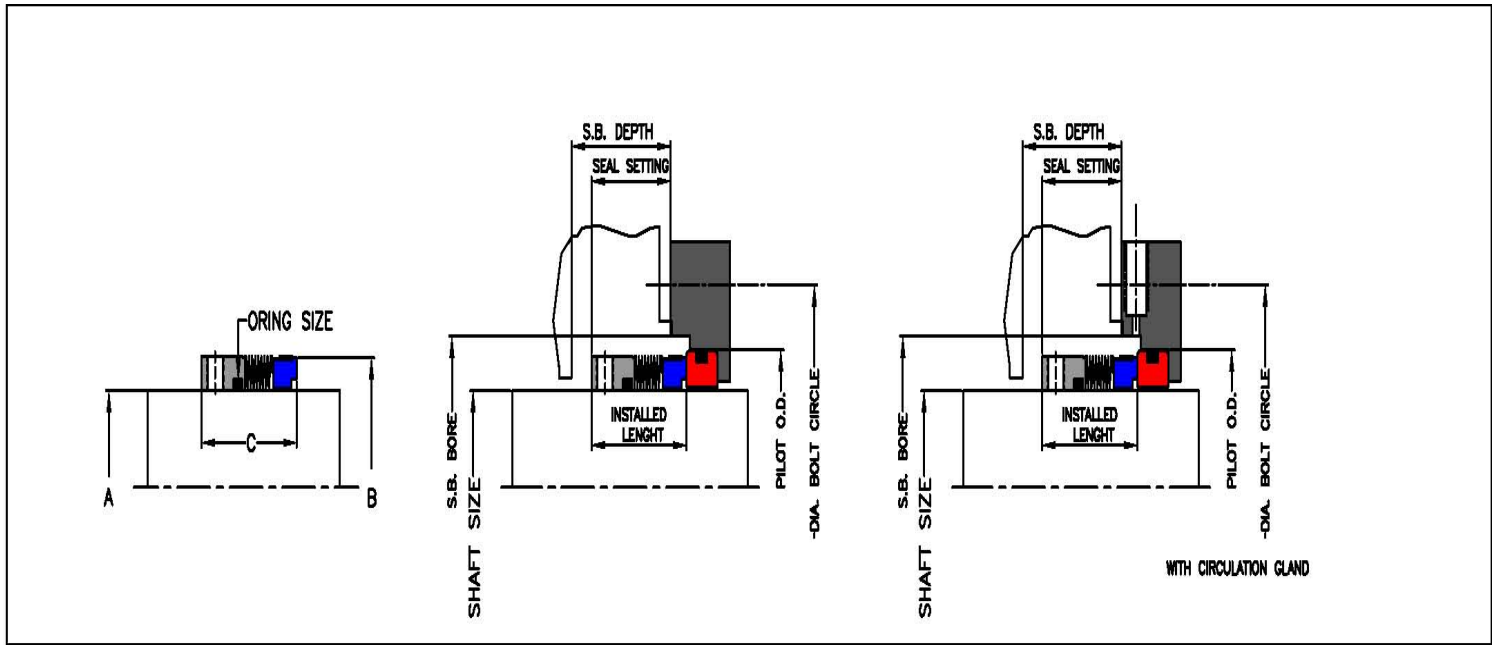
- Viton
- Epr-(Ethylene Propylene Rubber)
- Kalrez - 1050LF or 4079
- Chemraz - 505

Operating Conditions:

Shaft speeds to 4000 RPM
Pressures to 400 PSIG
Temperatures to 400F
(O rings can limit temperature)

Trademarks and Proprietors:

Hastelloy-	Cabot Corp
Kalrez/Viton-	/ E.I.Dupont Nemours
Hexoloy SA 80	/ Standard Oil Eng. Materials.
AM 350	/ Allegheny Ludium Steel Comp.
Monel	/ Inco Family of Companies
Purebon 658 RC	/ Pure Industries
Chemraz	/ Green Tweed



SEAL SIZE	SHAFT SIZE	PN#	SEAL O.D.	WORK LENGTH	O-RING SIZE
.937	15/16"	501030096JAAA	1.437	1.250	119
1.000	1"	501030100JAAA	1.562	1.250	120
1.125	1-1/8"	501030112JAAA	1.687	1.312	122
1.250	1-1/4"	501030125JAAA	1.812	1.312	124
1.375	1-3/8"	501030137JAAA	1.937	1.375	126
1.500	1-1/2"	501030150JAAA	2.062	1.500	128
1.625	1-5/8"	501030162JAAA	2.187	1.437	130
1.750	1-3/4"	501030175JAAA	2.375	1.500	132
1.875	1-7/8"	501030187JAAA	2.500	1.500	134
2.000	2"	501030200JAAA	2.625	1.500	136
2.125	2-1/8"	501030212JAAA	2.750	1.437	138
2.250	2-1/4"	501030225JAAA	2.812	1.562	140
2.375	2-3/8"	501030237JAAA	3.000	1.500	142
2.500	2-1/2"	501030250JAAA	3.2108	1.562	144
2.625	2-5/8"	501030262JAAA	3.360	1.562	146
2.750	2-3/4"	501030275JAAA	3.468	1.500	148
2.875	2-7/8"	501030287JAAA			150
3.000	3"	501030300JAAA	3.781	1.562	151
3.125	3-1/8"	501030312JAAA	3.906	1.625	235
3.250	3-1/4"	501030325JAAA	4.062	1.687	236
3.375	3-3/8"	501030337JAAA		1.687	237
3.500	3-1/2"	501030350JAAA	3.375	1.687	238
3.625	3-5/8"	501030362JAAA	4.437	1.812	239
3.750	3-3/4"	501030375JAAA			240
3.875	3-7/8"	501030387JAAA	4.687		241
4.000	4"	501030400JAAA			242

CHAMPION STYLE 502 ROTARY ROTATING METAL BELLOWS SEAL

- NESTED RIPPLE DESIGN BELLOWS
- PRECISION TIG WELDED BELLOWS
- SELF CLEANING ROTATING BELLOWS
- BALANCED SEAL DESIGN
- NO SHAFT OR SLEEVE FRETING
- SIC STATIONARY FACE IS STANDARD
- SUPERIOR FACE TRACKING
- NARROW FACE DESIGN FOR SUPERIOR HEAT CONTROL
- SUPERIOR ROTATING FACE THERMAL STABILITY



The model 502-C metal bellows mechanical seal is designed to give greatly improved service life over pusher seals. Because they are rotating bellows, they are especially well suited for handling problem fluids such as drilling muds, and crude oil containing sand. In refineries they can handle oil streams containing FCC catalyst fines when both seal faces are properly designed. Because the standard bellows material is Hastelloy-c, the 502-C metal bellows seals will give excellent service in a corrosive environment that would damage common alloys such as 316ss, alloy 20, or AM 350.

TECHNICAL DATA

MATERIALS OF CONSTRUCTION:

Bellows Material:

- Hastelloy C - 276 (ASTM B-334) Standard on 502-C
- Alloys such as Hastelloy B are also available
- Other alloys available.

Set Screws:

- Hastelloy C set screws are standard

Rotating Face:

- Pure 658 RC carbon is standard
- Tungsten Carbide (Nickel Bound)
- Silicon Carbide (Hexoloy SA 80)

Stationary Face:

- Silicon Carbide (Hexoloy SA 80)
- O ring mounted is standard
- Tungsten Carbide (Nickel Bound)

O-rings:

- Viton
- Epr-(Ethylene Propylene Rubber)
- Kalrez - 1050LF or 4079
- Chemraz - 505

Operating Conditions:

Shaft speeds to 4000 RPM
Pressures to 400 PSIG
Temperatures to 400F
(O rings can limit temperature)

Trademarks and Proprietors:

Hastelloy- - Cabot Corp
Kalrez/Viton- -E.I.Dupont Nemours
Hexoloy SA 80 - Standard Oil Eng. Materials.
AM 350 - Allegheny Ludium Steel Comp.
Monel - Inco Family of Companies
Purebon 658 RC - Pure Industries
Chemraz - Green Tweed

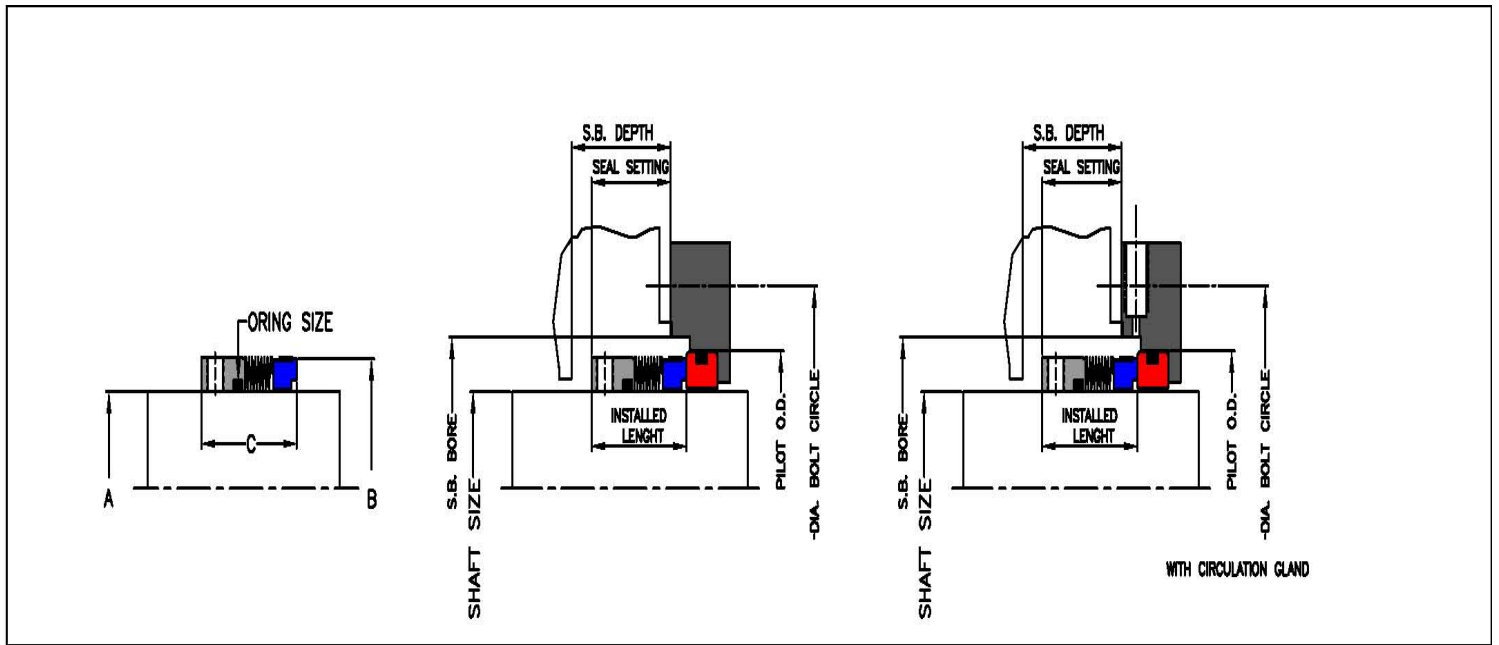
CHAMPION HI TECH MANUFACTURING

5565 MAUDLIN
HOUSTON, TX 77087
OFF - (713)-644-2181
FAX - (713)-644-1257



ODESSA, TX - (432)-337-2077
OKLAHOM CITY, OK - (405)-672-3301
CORPUS CHRISTI - (361)-765-8289

WEBSITE - CHAMPIONSEALS.COM



SEAL SIZE	SIZE	PN#	SEAL O.D.	WORK LENGTH	O-RING SIZE
.937	15/16"	502030093LAAA	1.437	1.250	119
1.000	1"	502030100LAAA	1.562	1.250	120
1.125	1-1/8"	502030112LAAA	1.687	1.312	122
1.250	1-1/4"	502030125LAAA	1.812	1.312	124
1.375	1-3/8"	502030137LAAA	1.937	1.375	126
1.500	1-1/2"	502030150LAAA	2.062	1.500	128
1.625	1-5/8"	502030162LAAA	2.187	1.437	130
1.750	1-3/4"	502030175LAAA	2.375	1.500	132
1.875	1-7/8"	502030187LAAA	2.500	1.500	134
2.000	2"	502030200LAAA	2.625	1.500	136
2.125	2-1/8"	502030212LAAA	2.750	1.437	138
2.250	2-1/4"	502030225LAAA	2.812	1.562	140
2.375	2-3/8"	502030237LAAA	3.000	1.500	142
2.500	2-1/2"	502030250LAAA	3.2108	1.562	144
2.625	2-5/8"	502030262LAAA	3.360	1.562	146
2.750	2-3/4"	502030275LAAA	3.468	1.500	148
2.875	2-7/8"	502030287LAAA			150
3.000	3"	502030300LAAA	3.781	1.562	151
3.125	3-1/8"	502030312LAAA	3.906	1.625	235
3.250	3-1/4"	502030325LAAA	4.062	1.687	236
3.375	3-3/8"	502030337LAAA			237
3.500	3-1/2"	502030350LAAA	3.375	1.687	238
3.625	3-5/8"	502030362LAAA	4.437	1.812	239
3.750	3-3/4"	502030375LAAA			240
3.875	3-7/8"	502030387LAAA	4.687		241
4.000	4"	502030400LAAA			242

CHAMPION STYLE 503 ROTARY ROTATING METAL BELLOWS SEAL

Metal Bellows Seal for High Temp Applications

- UNIQUE SEAL DRIVE ARRANGEMENT
- SIMPLISTIC SCREW ON ROTARY
- HIGH TEMPERATURE RELIABILITY
- PRESSURE BALANCED
- NO FRILLS DESIGN
- VERSATILE FACE MATERIALS
- GRAFOIL PACKINGS



The model 503-C metal bellows mechanical seal is designed to give greatly improved service life over pusher seals. Because they are rotating bellows, they are especially well suited for handling problem fluids such as drilling muds, and crude oil containing sand. In refineries they can handle oil streams containing FCC catalyst fines when both seal faces are properly designed. Because the standard bellows material is Hastelloy-c, the 503-C metal bellows seals will give excellent service in a corrosive environment that would damage common alloys such as 316ss, alloy 20, or AM 350.

TECHNICAL DATA

MATERIALS OF CONSTRUCTION:

Bellows Material:

- AM 350 HT
- Alloys such as Hastelloy B are also available
- Other alloys available.

Operating Conditions:

Shaft speeds to 3600 RPM
Pressures to 350 PSIG
Temperatures to 800F
Sizes—1" - 4" at 1/8" increments

Set Screws:

- Hastelloy C set screws are standard

Rotating Face:

- Pure 658 RC carbon is standard
- Tungsten Carbide (Nickel Bound)
- Silicon Carbide (Hexoloy SA 80)

Stationary Face:

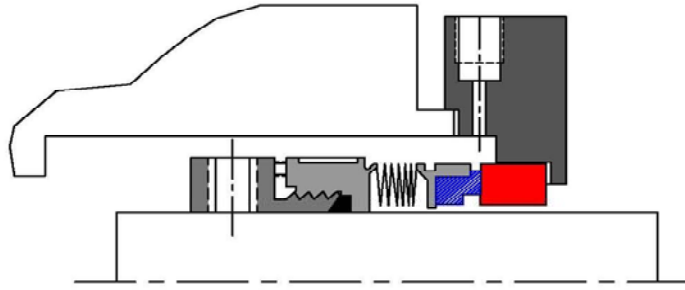
- Silicon Carbide (Hexoloy SA 80)
- O ring mounted is standard
- Tungsten Carbide (Nickel Bound)

O-rings:

- Grafoil

Trademarks and Proprietors:

Hastelloy- - Cabot Corp
Kalrez/Viton- -E.I.Dupont Nemours
Hexoloy SA 80 - Standard Oil Eng. Materials
AM 350 - Allegheny Ludium Steel Comp.
Monel - Inco Family of Companies
Purebon 658 RC - Pure Industries
Chemraz - Green Tweed



SEAL SIZE	SIZE	PN#	SEAL O.D.	WORK LENGTH	O-RING SIZE
.937	15/16"	503030093LRAA	1.437	1.250	119
1.000	1"	503030100LRAA	1.562	1.250	120
1.125	1-1/8"	503030112LRAA	1.687	1.312	122
1.250	1-1/4"	503030125LRAA	1.812	1.312	124
1.375	1-3/8"	503030137LRAA	1.937	1.375	126
1.500	1-1/2"	503030150LRAA	2.062	1.500	128
1.625	1-5/8"	503030162LRAA	2.187	1.437	130
1.750	1-3/4"	503030175LRAA	2.375	1.500	132
1.875	1-7/8"	503030187LRAA	2.500	1.500	134
2.000	2"	503030200LRAA	2.625	1.500	136
2.125	2-1/8"	503030212LRAA	2.750	1.437	138
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2.375	2-3/8"	503030237LRAA	3.000	1.500	142
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2.625	2-5/8"	503030262LRAA	3.360	1.562	146
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2.875	2-7/8"	503030287LRAA			150
3.000	3"	503030300LRAA	3.781	1.562	151
3.125	3-1/8"	503030312LRAA	3.906	1.625	235
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3.500	3-1/2"	503030350LRAA	3.375	1.687	238
3.625	3-5/8"	503030362LRAA	4.437	1.812	239
3.750	3-3/4"	503030375LRAA			240
3.875	3-7/8"	503030387LRAA	4.687		241
4.000	4"	503030400LRAA			242



CHAMPION 501C / 502C / 503C

PUMP INFORMATION

PUMP COMPANY	PUMP TYPE	PUMP SIZE	SLV DIA.	STUFF BOX BORE DPTH		NRST OBST	SEAL SET W/CIR-W/O CIR		BOLT DIA	# BOLT	O.D. PILOT
DEAN	PH	200	1.000	1.625	2.125	2.125	.812	1.312	3.000	4-3/8"	2.375
DURIRON	MK II	GRP 1	1.125	1.750	2.187	2.125	.875	1.375	2.875	4-3/8"	2.250
IR	HOC	GRP 1	1.125	1.812	2.250	1.781	.875	1.375	3.500	4-3/8"	2.372
LABOUR	LV	S	1.125	1.750	2.187	2.187	.875	1.375	3.250	4-3/8"	2.375
WRTGHN	D1000	FRM 1	1.125	1.750	2.050	2.000	.875	1.375	2.562	4.937	1.941
GOULDS	3196	ST	1.375	2.000	2.125	2.187	.937	1.437	3.250	4-3/8"	2.395
WRTGHN	D1000	FRM2	1.375	2.000	2.320	2.625	.937	1.437	3.250	4-3/8"	2.380
AC	CSO	LN 3	1.750	2.500	2.750	2.875	1.062	1.562	3.625	4-3/8"	N/A
DEAN	PH	230	1.750	2.500	2.750	2.187	1.062	1.562	4.125	4-1/2"	3.437
GOULDS	3196	MT	1.750	2.500	2.625	2.875	1.062	1.562	4.125	4-1/2"	3.020
WRTGHN	D1000	FRM 3	1.750	2.500	2.830	2.687	1.062	1.562	4.125	4-1/2"	3.002
DURIRON	MK II	GRP 2	1.875	2.625	2.625	3.000	1.062	1.562	3.750	4-3/8"	3.125
IR	HOC	GRP 2	1.875	2.687	2.687	2.062	1.062	1.562	4.500	4-1/2"	3.247
LABOUR	LV	L	1.875	2.625	2.625	3.000	1.062	1.562	4.000	4-1/2"	3.125
AC	CSO	LN 4	2.000	2.750	2.750	2.875	1.000	1.500	3.875	4-3/8"	3.250
DEAN	PH	340	2.125	2.875	2.750		1.000	1.500	4.875	4-5/8"	4.000
GOULDS	3196	LT	2.125	2.875	2.250	3.000	1.000	1.500	4.500	4-1/2"	3.520
IR	HOC	2125	2.125	2.9378	2.687	2.062	1.000	1.500	4.750	4-1/2"	3.500
WRTGHN	D1000	FRM 4	2.125	2.875	2.830	3.562	1.000	1.500	4.625	4-1/2"	3.504
DEAN	PH	250	2.250	3.250	3.875				5.500	4-5/8"	4.500
IR	HOC	GRP 3	2.375	3.437	3.562	3.375			5.250	4-1/2"	4.000
GOULDS	3196	XLT	2.500	3.375	3.000	2.937	1.125	1.625	5.375	4-5/8"	3.998
LABOUR	LT	XL	2.500	3.375	3.000	3.000	1.125	1.625	5.187	4-1/2"	4.020
DURIRON	MK II	XL	2.625	3.625	3.250	3.812	1.125	1.625	5.500	4-1/2"	4.250
WRTGHN	D1000	FRM 5	2.750	3.750	3.781		1.062	1.437			

CHAMPION STYLE 510 SEAL MOUNTED SEAL FOR VIKING PUMPS

ALL THE ADVANTAGES OF A WELDED BELLOWS SEAL WITH THE
INSTALLATION ASSURANCE OF A CARTIDGE SEAL



FEATURES:

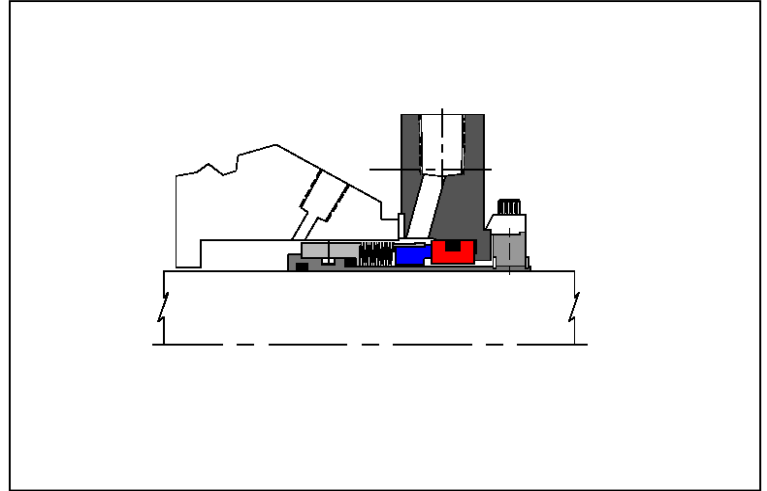
- Self cleaning Rotating Bellows
- Static O-ring Design
- 360 degrees Even Face Loading
- Accepts more Misalignment than Pusher Seals
- No Shaft Fretting
- Variety of Face Combinations
- Superior Alloy Construction

TECHNICAL DATA:

MATERIALS OF CONSTRUCTION:

- | | | | |
|----------------------------------|---|---------------------|----------------|
| • Metal Parts: | 316 SS / Hastelloy C | Temperature: | -65 F to 375 F |
| • Set Screws: | 316SS / Hastelloy C | Pressure: | 300 PSI Max |
| • Bellows: | 316SS / Hastelloy C | | |
| • O-rings: | Per Customer Requirements | | |
| • Rotating Face Material: | Carbon
Tungsten Carbide
Silicone Carbide | | |
| • Sta. Face Materials: | Ceramic
Tungsten Carbide
Silicone Carbide | | |

The CHAMPION 550 series of Metal Bellows Cartridge Seals are custom engineered for each application.



The CHAMPION 551 Cartridge Seal is an inside mounted single seal with balanced ratios and seal face materials designed for your specific application. Glands are designed to meet API requirements when specified by the customer.

TECHNICAL DATA

Materials of Construction:

- Bellows material: Hastelloy "C"
Other Alloys Available
- Bellows Tail Fitting: 316SS
- Set Screws: HC is standard
Other Alloys Available
- Rotating Face:
Purebon 658 RC CBN/CNFJ
Tungsten Carbide (Nickel Matrix)
Silicon Carbide (Hexoloy SA-80)
- Stationary Face:
Silicon Carbide (Hexoloy SA-80)
O-ring mounted
Tungsten Carbide (Nickel Matrix)
- Set Screws: HC is standard
- O-rings: Viton
EPR
Kalrez
Chemraz

Operating Conditions:

Speed sup to 80 FPS
Pressures to 400 PSIG
Temps to 400* F

CHAMPION HI TECH MANUFACTURING

5565 MAUDLIN
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OKLAHOM CITY, OK - (405)-672-3301
CORPUS CHRISTI - (361)-765-8289

WEBSITE - CHAMPIONSEALS.COM

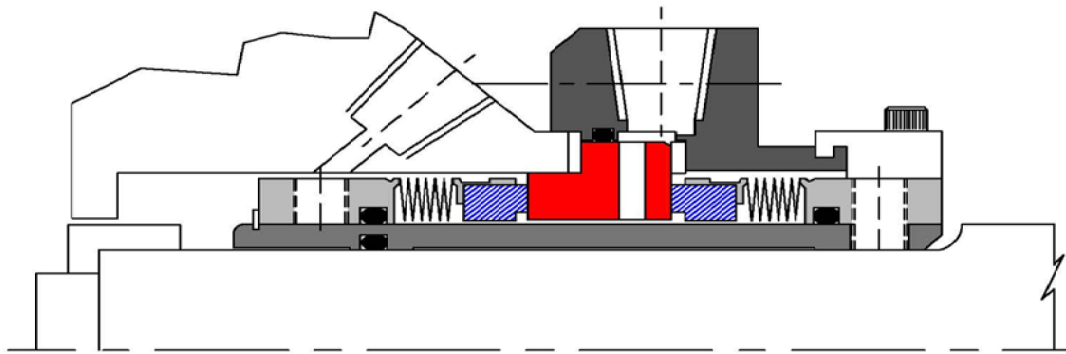
Champion 552 Dual Bellows Seal

The CHAMPION 550 series of Metal Bellows Cartridge Seals are custom engineered for each application.



The 552 Bellows Cartridge Seal is a DUAL (face to face) orientation. In the DUAL seal orientation, the rotating faces face each other. Dual seal orientation is well suited in the applications where axial dimensions are limited. In this design, both the primary and secondary bellows are rotating and are DUAL balanced. This means that the seal will remain closed with the buffer fluid pressure is either higher or lower than the fluid pressure. In order to do this, the bellows design utilizes a variable balance ratio feature. Thus the 552 Cartridge can operate as a double seal with the buffer fluid pressure greater than the process fluid pressure or as a tandem seal with the buffer fluid pressure less than the process fluid pressure.

It is important to remember that the DUAL seal design keeps the process fluid on the O.D. of the primary bellows seal not the I.D. of the bellows as is in some designs. The result is a cooler and cleaner running seal assembly.



TECHNICAL DATA

Materials of Construction:

- Bellows material: Hastelloy "C"
Other Alloys Available
- Bellows Tail Fitting: 316SS
- Set Screws: HC is standard
Other Alloys Available
- Rotating Face:
Purebon 658 RC CBN/CNFJ
Tungsten Carbide (Nickel Matrix)
Silicon Carbide (Hexoloy SA-80)
- Stationary Face:
Silicon Carbide (Hexoloy SA-80)
O-ring mounted
Tungsten Carbide (Nickel Matrix)
- Set Screws: HC is standard
- O-rings: Viton
EPR
Kalrez
Chemraz

Operating Conditions:

Speed sup to 80 FPS
Pressures to 400 PSIG
Temps to 400* F

Trademarks and Proprietors:

Hastelloy-	- Cabot Corp
Kalrez/Viton-	-E.I.Dupont Nemours
Hexoloy SA 80 -	Standard Oil Eng. Materials
AM 350	- Allegheny Ludium Steel Comp
Monel	- Inco Family of Companies
Purebon 658 RC	- Pure Industries
Chemraz	- Green Tweed

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Champion 553 Tandem Bellows Seal

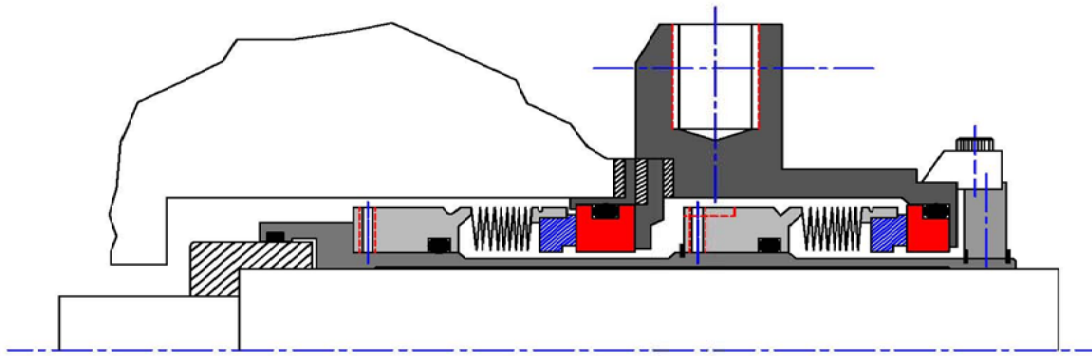
The CHAMPION 550 series of Metal Bellows Cartridge Seals are custom engineered for each application.



The CHAMPION 553 Bellows Cartridge Seal is a true tandem seal as defined by API Standard 610, 7th Edition, page 69, figure D-1. a true tandem seal is the preferred seal in many applications, especially emissions control, when pump axial dimensions permit its use. Its heavy duty bellows and construction features make it well suited for API pumps.

In a true tandem seal, the process fluid is always on the O.D. of the primary seal, and the buffer fluid is always on the O.D. of the secondary seal. This arrangement provides better cooling and cleaner running for the secondary seal.

The 553 also employs Dual Balanced seals to permit operation with the buffer fluid at either a higher or lower pressure than the process fluid.



TECHNICAL DATA

Materials of Construction:

- Bellows material: Hastelloy "C"
Other Alloys Available
- Bellows Tail Fitting: 316SS
- Set Screws: HC is standard
Other Alloys Available
- Rotating Face:
Purebon 658 RC CBN/CNFJ
Tungsten Carbide (Nickel Matrix)
Silicon Carbide (Hexoloy SA-80)
- Stationary Face:
Silicon Carbide (Hexoloy SA-80)
O-ring mounted
Tungsten Carbide (Nickel Matrix)
- Set Screws: HC is standard
- O-rings: Viton
EPR
Kalrez
Chemraz

Operating Conditions:

Speed sup to 80 FPS
Pressures to 400 PSIG
Temps to 400* F

Trademarks and Proprietors:

Hastelloy-	- Cabot Corp
Kalrez/Viton-	-E.I.Dupont Nemours
Hexoloy SA 80	- Standard Oil Eng. Materials
AM 350	- Allegheny Ludium Steel Comp
Monel	- Inco Family of Companies
Purebon 658 RC	- Pure Industries
Chemraz	- Green Tweed

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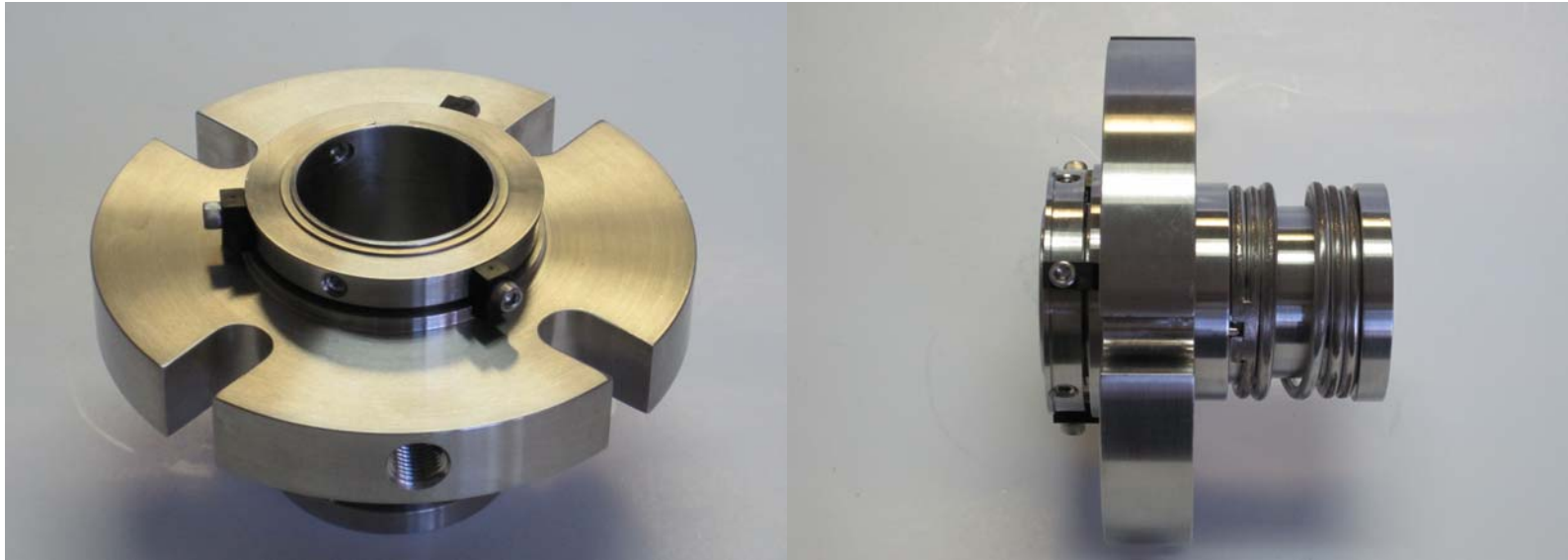


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Champion 651 Cartridge Seal

HI-BALANCE SINGLE SPRING PUSHER SEAL



The CHAMPION 651 single spring design is a result of many years of seal design and plant maintenance experience. In the design, the engineering goals were:

1. Performance
2. Simplicity
3. Economy

FEATURES

- Replaceable Rotating Face Insert
- Rotating Spring
- No Shaft or Sleeve Fretting
- Premium Seal Face Materials

The engineering features have been obtained by:

1. Bi-Directional Single Spring Drive
2. Heavy duty coil rotating spring for self-cleaning performance. No more micro springs that are easily fouled whether they are wetted or not wetted.
3. Only three modular assemblies:
 - Gland
 - Spring
 - Sleeve
4. Hi Balance design especially suited for the ANSI pump pressure conditions.
5. Narrow seal face design for low heat generation.

TECHNICAL DATA:

Materials of Construction:

Alloys

- 316SS
- Other Alloys

Seal Faces

- Purebon 658 RC Carbon
- Tungsten Carbide
- Sintered Alpha Silicone Carbide

O-Rings

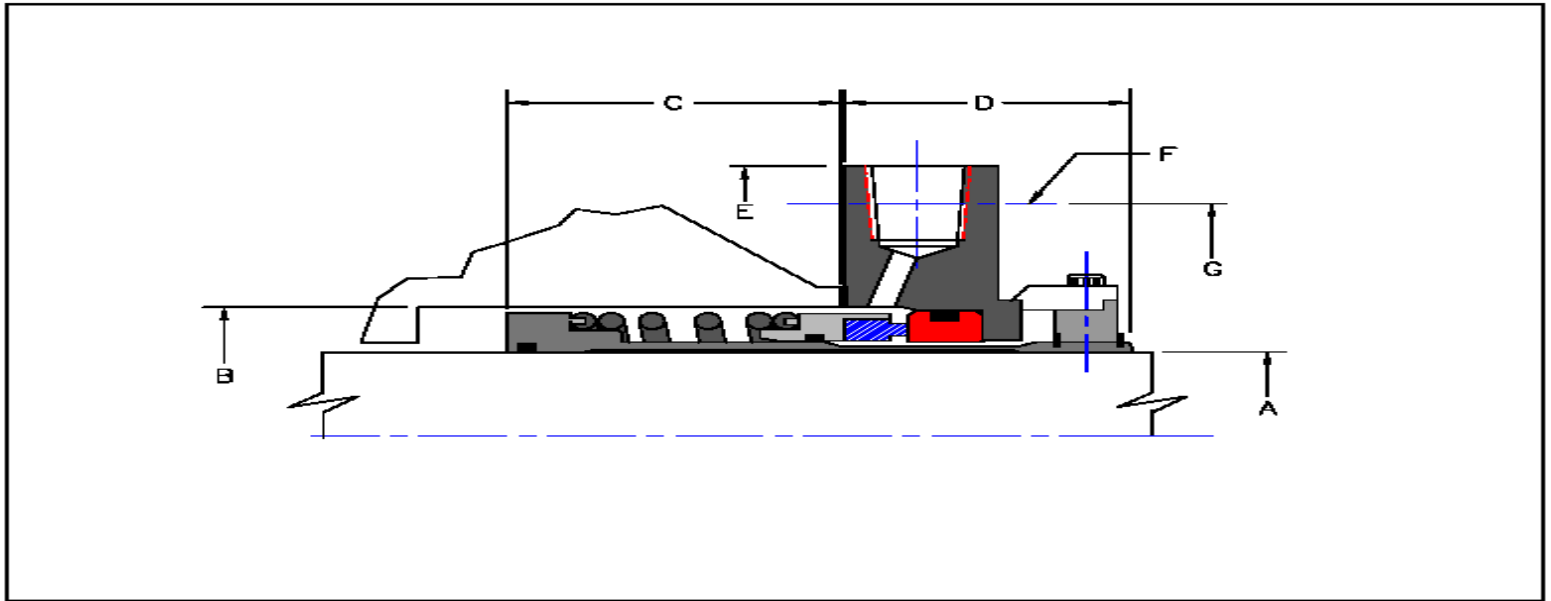
- Viton
- Other Compounds available

Operating Conditions:

Seal Surface Speeds to 70 FPS
Test Pressures to 200 PSIG
Temperatures to 350 F

Trademark and Proprietors:

Purebon Pure Industries
Viton E.I. Dupont Denemours and Co



A	B		C	D	E	F	G—MIN. BOLT CIRCLE BY BOLT SIZE		
	MIN	MAX					3/8"	1/2"	5/8"
1"	1.625	1.750	1.937	1.562	4.125	.437	2.750		
1-1/8"	1.750	1.875	1.937	1.562	4.250	.437	2.875		
1-1/4"	1.875	2.000	1.937	1.562	4.375	.437	3.125		
1-3/8"	2.000	2.125	1.937	1.562	4.500	.437	3.250		
1-1/2"	2.125	2.375	1.937	1.562	5.000	.437	3.375		
1-5/8"	2.375	2.500	1.937	1.562	5.250	.562	3.500	3.625	
1-3/4"	2.500	2.625	1.937	1.562	5.500	.562	3.625	3.750	
1-7/8"	2.625	2.750	1.937	1.562	5.500	.562	3.750	3.875	
2"	2.750	3.000	1.937	1.562	5.750	.562	4.000	4.125	
2-1/8"	2.875	3.125	N/A	N/A	6.000	.687	4.250	4.375	4.500
2-1/4"	3.000	3.250	N/A	N/A	6.250	.687	4.375	4.500	4.625
2-3/8"	3.125	3.375	N/A	N/A	6.250	.687	4.500	4.625	4.750
2-1/2"	3.250	3.500	2.156	1.656	6.500	.687	4.625	4.750	4.875
2-5/8"	3.375	3.625	N/A	N/A	7.625	.687		5.437	5.562

OTHER SIZES AVAILABLE UPON REQUEST

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Champion T-2/2B PUSHER SEAL ELASTOMER BELLOWS SEAL



APPLICATIONS:

- FOR CONFINED SPACE REQUIREMENTS AND LIMITED SEAL CHAMBER DEPTHS IN PUMPS, MIXERS, BLENDEES, AGITATORS, COMPRESSORS AND OTHER ROTARY SHAFT EQUIPMENT.
- FOR PULP AND PAPER, PETROCHEMICAL, FOOD PROCESSING, WASTEWATER TREATMENT AND OTHER DEMANDING APPLICATIONS.

DESIGN FEATURES/BENEFITS:

- SELF ALIGNING: AUTOMATIC ADJUSTMENT COMPENSATES FOR ABNORMAL SHAFT AND PLAY (RUN OUT) , PRIMARY RING WEAR, AND EQUIPMENT TOLERANCES.
- MECHANICAL DRIVE: THE DRIVE BANDS NOTCH DESIGN ELIMINATES OVER-STRESSING OF THE ELASTOMER BELLOWS. BELLOWS SLIP IS ELIMINATED. THE SHAFT AND SLEEVE ARE PROTECTED FROM WEAR.
- NON-CLOGGING, SINGLE COIL SPRING: PROVIDES GREATER DEPENDABILITY THAN MULTI SPRING DESIGNS. WILL NOT FOUL DUE TO FLUID CONTACT.
- SPECIAL BALANCING: FOR HIGHER PRESSURE APPLICATIONS, GREATER OPERATING SPEEDS AND WEAR.
- COMPLETELY FIELD REPAIRABLE: BOTH TYPES 2 AND 2B CAN BE REPAIRED IN THE FIELD TO MINIMIZE REPLACEMENT COSTS, DOWNTIME AND LOST REVENUE.

INDUSTRIES SERVED:

- CHEMICAL PROCESSING, CRYOGENICS, FOOD PROCESSING, GAS COMPRESSION, MARINE, MIXERS AND AGITATORS, OFFSHORE, OIL AND REFINERY, PETROCHEMICAL PROCESSING, PIPELINE, PULP AND PAPER, WATER SYSTEMS AND WASTEWATER.

TECHNICAL DATA:

Materials of Construction:

Alloys

- 316SS
- Other Alloys

Seal Faces

- Purebon 658 RC Carbon
- Tungsten Carbide
- Sintered Alpha Silicone Carbide
- Ceramic

O-Rings

- Viton
- Other Compounds available

Operating Conditions:

-40F + 400F

DEPENDING ON MATERIALS USED.

PRESSURES:

T-2: 425 PSIG

T-2B: 1200 PSIG

Trademark and Proprietors:

Purebon

Pure Industries

Viton

E.I. Dupont Denemours and Co

STATIONARY FACES

O-Ring Mount

Cup Mount