MECHVORA
ENGINEERING WORKS

PRECISION IN EVERY PART

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INTRODUCTION

ACUSENCE SEALS INDIA incorporated in 2010 is engaged in the Business of Manufacturing, Designing, and Marketing and Exporting a wide range of high quality Mechanical Seals, Rotary Joints (Rotary Unions, Roto Seal Couplings) and Associated products to cater the growing needs of process industries.

ABOUT US

With our Genuine Quality Products, Excellent Service, Consistent Performance and Competitive Prices, ACUSENCE SEALS INDIA has built up a strong reputation to meet the growing demand of customers over the global market.

ACUSENCE SEALS INDIA design's and manufacture's ROTARY joints and Mechanical Seals for rotating equipment’s including Pumps, Reactor Vessels, Mixers,

Compressors, Separators, Steam Turbines, Rollers and other various applications for Pharmaceuticals, Chemicals, Petrochemicals, Fertilizers, Refineries, Power Plant, Paper and Pulp as well as other major industries.

QUALITY ORIENTATION

Quality is the Forte of Our Esteemed Organization and we are Highly Committed towards Delivering Advanced Quality Products to Patrons. We Follow International Quality Standards and Thereby Manufacture Products from Finest Raw Materials. Moreover, We Focus On Product Optimization and Therefore Conduct Various Quality Tests On Unlike Quality Parameters.

OUR MISSION

We as ACUSENCE SEALS INDIA are committed

a) To Engineer and Manufacture high quality mechanical shaft seals, Rotary joints with a competitive price.

b) To deliver professional sealing products and service in small or large quantity.

c) To completely satisfy our customer and enhance their profitability.

d) To introduce ourselves as Manufacturer, Trader and Exporter of Mechanical Shaft Seals, Pumps and Pump Spares.

e) To maintain Truly Personal Approach.

ACUSENCE SEALS INDIA supplies products to various industries like Chemical, Pharmaceutical,

Petrochem, Dairy, Food and Beverages, Sugar Plant, Refineries, Fertilizers, pulp and papers etc.

Rubber Bellow seal

Face Materials	Silicon Carbide, Carbon, Tungsten Carbide, Ceramic
Metal Parts	AISI SS 316, AISI SS 304
Seal Elastomer	Viton, EPDM, NBR
Applications	Water Pumps, Submersible Pumps, Sewage pump
Operating Limits	Shaft Diameter d1 :10....100mm Pressure p : 10 bar (max) temperature : -20....+180°C Speed: 3000 r.p.m

Rubber Bellow seal

Face Materials	Silicon Carbide, Carbon, Tungsten Carbide, Ceramic
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Seal Elastomer	Viton, EPDM, NBR
Applications	Water Pumps, Submersible Pumps, Sewage pump
Operating Limits	Shaft Diameter d1 :10....100mm Pressure p : 10 bar (max) temperature : -20....+180°C Speed: 3000 r.p.m

Conical Coil Single Spring seal

Face Materials	Carbon, Ceramic, Tungsten Carbide, Silicon Carbide, Lecrolloy
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	Water Pumps, Circulation Pumps for Central heating Chemical Process Pumps, Sewage & Submersible Pumps
Operating Limits	Shaft Diameter d1 :12....90mm Pressure p : 08 bar (max) temperature : -20....+180°C Speed: 3000 r.p.m

Single Coil Spring seal

Face Materials	Carbon, Ceramic, Tungsten Carbide, Silicon Carbide, Lecrolloy
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	Viton, EPDM, Silicon, Aflas, GFT, Karlez, FEP, TTV, PTFE
Applications	Crystallizing Slurry, Suspended Solids Slurry, Saturated Chemical Slurry, General Chemical Slurry
Operating Limits	Shaft Diameter d1 :12....100mm Pressure p : 12 bar (max) temperature : -20....+180°C Speed: 3000 r.p.m

Multi Spring seal

Face Materials	Carbon, Ceramic, Silicon Carbide, Tungsten Carbide
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	Light Hydrocardons, Corrosive Services, Acids & Alkalies, Petrochemicals etc.
Operating Limits	Shaft Diameter d1 :20....100mm Pressure p : 20 bar (max) temperature : +180°C Speed: 3000 r.p.m

PTFE Bellow seal

Face Materials	GFT, Ceramic, Silicon Carbide, CFT
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	PTFE
Applications	Extremely Corrosive Services
Operating Limits	Shaft Diameter d1 :18....100mm Pressure p : 06 bar (max) temperature : -30....+120°C Speed: 3000 r.p.m

Ptfe Bellow With Replaceable Face

Face Materials	GFT, Ceramic, Silicon Carbide, CFT
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	PTFE
Applications	Extremely Corrosive Services
Operating Limits	Shaft Diameter d1 :18....100mm Pressure p : 06 bar (max) temperature : -30....+120°C Speed: 3000 r.p.m

Reverse Balance Multi Spring Seal

Face Materials	Carbon, Ceramic, Silicon Carbide, Tungsten Carbide
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	Viton, EPDM, TTV, FEP and FKM
Applications	Light Hydrocardons, Corrosive Services, Acids & Alkalies, Petrochemicals etc.
Operating Limits	Shaft Diameter d1 :12....70mm Pressure p : 08 bar (max) temperature Upto....+120°C Speed: 3000 r.p.m

Metal Bellow Seal

Face Materials	Carbon, Silicon Carbide, Tungsten Carbide.
Metal Parts	AISI SS 316, AISI SS 304, Carpenter 42 Hast- C, Am350, Inconel
Seal Elastomer	Grafoil, Viton, CFT, KARLEZ.
Applications	Chemicals, Petrochemnical, Refinery, Corrosive Chemical, Extreme Hot Media.
Operating Limits	Shaft Diameter d1 :25....100mm Pressure p : 25 bar (max) temperature : -70....+350°C Speed: 3000 r.p.m

Grundfos Seal

Face Materials	Carbon, Ceramic, Silicon Carbide, Tungsten Carbide
Metal Parts	AISI SS 316, AISI SS 304
Seal Elastomer	Viton, EPDM, Nitrile
Applications	Slurry pump, Pulp & paper, Sludge & Syrup pump, Chemical, Petrochemical & Refinery
Operating Limits	Shaft Diameter d1 :12....22mm Pressure p : 05 bar (max) temperature : -45....+180°C

Single Spring Seal

Face Materials	Carbon, Ceramic, Tungsten Carbide, Silicon Carbide, Lecrolloy
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	Viton, EPDM, Silicon, Aflas, GFT, Karlez, FEP, TTV, PTFE
Applications	Crystallizing Slurry, Suspended Solids Slurry, Saturated Chemical Slurry, General Chemical Slurry
Operating Limits	Shaft Diameter d1 :12....100mm Pressure p : 12 bar (max) temperature : -20....+180°C Speed: 3000 r.p.m

Wave Spring Seal

Face Materials	Carbon, Ceramic, Silicon Carbide, Tungsten Carbide.
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20
Seal Elastomer	Viton, EPDM, TTV, FEP and FKM
Applications	Slurry pump, Pulp & paper, Sludge & Syrup pump, Chemical, Petrochemical & Refinery
Operating Limits	Shaft Diameter d1 :12....70mm Pressure p : 08 bar (max) temperature Upto....+120°C Speed: 3000 r.p.m

Single Cartridge Seal

Face Materials	Carbon, Tungsten Carbide, Silicon Carbide
Metal Parts	AISI SS 316, AISI SS 304, Carpenter 42
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	Slurry pump, Pulp & paper, Sludge & Syrup pump, Chemical, Petrochemical, Refinery, Light Hydrocarbons.
Operating Limits	Shaft Diameter d1 :18....100mm Pressure p : 5.....35 bar (max) temperature : -20....+260°C Speed : 3000 r.p.m

Dual Cartridge Seal

Face Materials	Carbon, Silicon Carbide, Tungsten Carbide, Lacrolloy
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20 etc.
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	Slurry pump, Pulp & paper, Sludge & Syrup pump, Chemical, Petrochemical & Refinery
Operating Limits	Shaft Diameter d1 :18....100mm Pressure p : 05...35 bar (max) temperature : -20.....260°C Speed: 3000 r.p.m

Metal Bellow Cartridge Seal

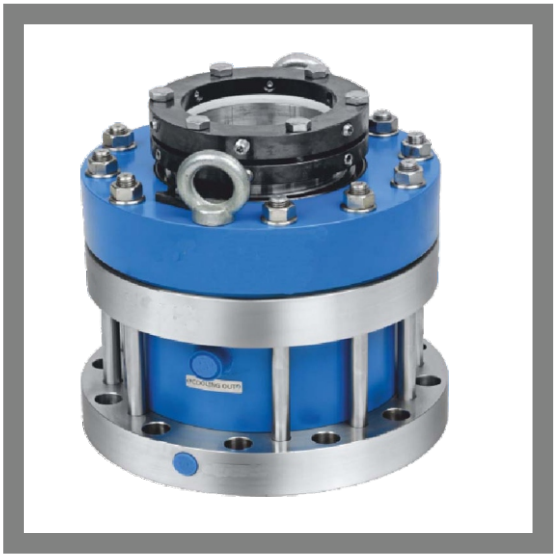
Face Materials	Carbon, Silicon Carbide, Tungsten Carbide.
Metal Parts	AISI SS 316, AISI SS 304, Carpenter 42 Hast- C, Am350, Inconel
Seal Elastomer	Grafoil, Viton, CFT, KARLEZ.
Applications	Chemicals, Petrochemnical, Refinery, Corrosive Chemical, Extreme Hot Media.
Operating Limits	Shaft Diameter d1 :25....100mm Pressure p : 25 bar (max) temperature : -70....+350°C Speed: 3000 r.p.m

Slurry Seal

Face Materials	Carbon, Silicon Carbide
Metal Parts	SS 316, SS 304
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	Slurry pump, Pulp & paper, Sludge & Syrup pump, Chemical, Petrochemical & Refinery
Operating Limits	Shaft Diameter d1 :18….100mm Pressure p : 5.....25 bar (max) temperature : -40….+260°C Speed : 3000 r.p.m

Dry Running Seal

Face Materials	Carbon , Silicon Carbide, Tungsten carbide, Ceramic
Metal Parts	AISI SS 316, AISI SS 304, MS Etc.,
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	Food Products, Pharmaceutical Products
Operating Limits	Shaft Diameter d1 :15….150mm Pressure p : 08 bar (max) temperature : -30.....150°C Speed: 3000 r.p.m



Dual Agitator Seal

Face Materials	Carbon, Silicon Carbide, Tungsten Carbide, Lacrolloy, Ceramic.
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20 etc.
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	General Chemicals & It's Vapours, Petrochemicals & It's Vapours, Light Hydrocarbons & It's Vapours, Pharmaceutical & Industries, Paper Industries Etc.
Operating Limits	Shaft Diameter d1 :25….200mm Pressure V.....30 bar (max) temperature : -30….+260°C Speed: 3000 r.p.m

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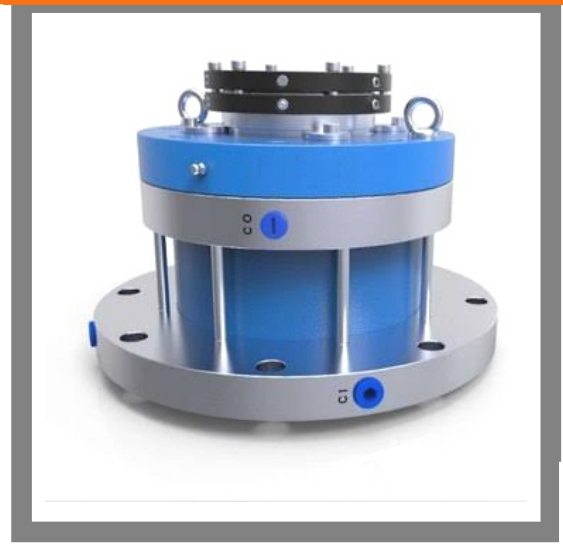
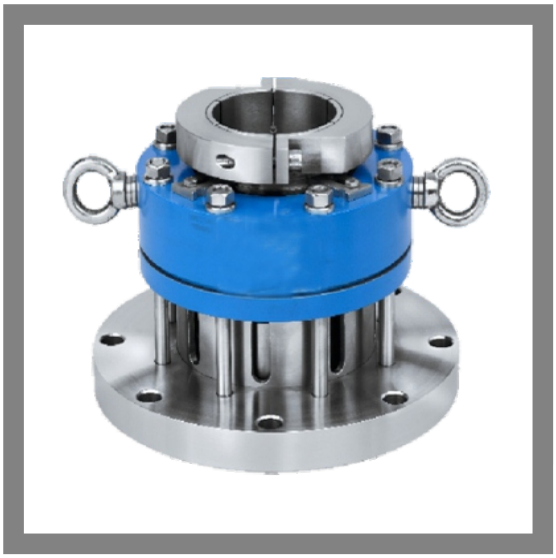


Single Agitator Seal

Face Materials	Carbon, Silicon Carbide, Tungsten Carbide, Ceramic
Metal Parts	AISI SS 316, AISI SS 304, HASTELLOY-C, ALLOY-20 etc.
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Applications	Corrosive Chemical, General light Chemical, Food Products, Pharmaceutical Products
Operating Limits	Shaft Diameter d1 :25....200mm Pressure V.....30 bar (max) temperature : -30....+260°C Speed: 3000 r.p.m



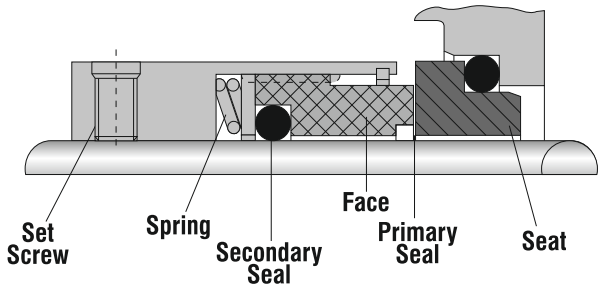
Dry Running Seal For Glass Line

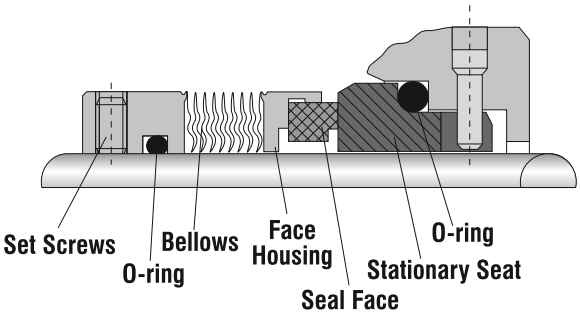
Face Materials	Carbon, Silicon Carbide, Ceramic
Metal Parts	SS 316, SS 304
Seal Elastomer	Viton, EPDM, Silicon, Aflas, PTFE, GFT, Karlez, FEP, TTV
Operating Limits	Shaft Diameter d1 : 25....150mm Pressure p : 08 bar (max) temperature : -30.....150°C Speed: 250 r.p.m

Thermosyphon Vessel

Metal Parts	Thermosyphon Shell : Carbon Steel / SS 304 / SS 316 / MS Cooling Coil : SS 304 / SS 316
Operating Limits	20 Pressure Limit : 20 bar 40 Pressure Limit : 40 bar Temperature (max) : 200°C

The technology has come off the age and proved to be environmental protection system. API 682 standard is devoted standard for mechanical seals. The new sealing technologies are based on advanced computer programs used to optimize the seal designs. Combined with advancements in the seal face materials the equi pment availability and reliability has increased substantially. Other related standards are: API 610,DIN 24960,ISO 3609,DIN EN 12756 and ISO 21049.





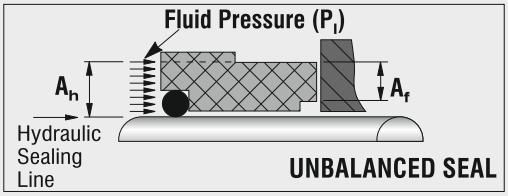
SEALING TECHNOLOGY

BASIC SEAL CONSTRUCTION

Sealing Mechanism: Two lapped faces, one rotating with shaft and another stationary in gland are brought in contact with each other by means of spring force. The surfaces are separated by micron thickness of film of fluid being sealed. The generation of this film is automatic due to micro asperities on the lapped surfaces.
Thus the film acts as a lubricant and reduces the friction and heat generation well within the limits of seal face materials. Generally the lubrication regime is mixed one. Typical coefficient of friction is 0.07 for general purpose seals and 0.015 for well designed high pressure seals.

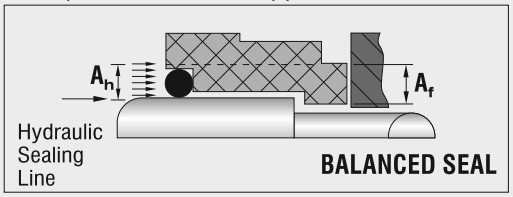
Seal Balance = $\frac{A_h}{A_f}$ and is >1

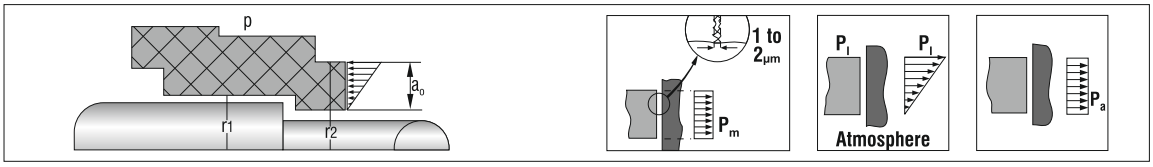
Seal is unbalanced because a high proportion of the hydraulic load is applied to the fluid film.



Seal Balance = $\frac{A_h}{A_f}$ and is <1

Seal is balanced because a lower proportion of the hydraulic load is applied to the fluid film.





Seal Balancing: For seal to perform, the seal faces must be in contact with each other in dynamic conditions. The heat generation due to interface pressure load must not vaporize the liquid film. Seal balancing is a geometrical feature provided to seal face that avoids such condition.

Interface Pressure = Pf =Δp(b-k)+Psp
Diff. pressure across seal = Δp
k = Seal face press. Variation constant = 0.5 generally
Psp = Spring load pressure on face = 1.8 to 2.8 kg/ cm^2.

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MATERIALS

Most of the seal designs have stood the test of time and are still in regular usage. The improvements, however, have been tremendous in the seal face materials. The development of superior and highly reliable resin impregnated carbon as also antimony impregnated carbon has enable successful seal operation even in marginal lubrication conditions particularly in light hydrocarbon and high temperature water applications.

For corrosive liquids resin impregnated carbon and sintered silicon carbide grades have proved the ideal solutions. The hardness and thermal conductivity of silicon carbide is extremely high as shown in the table below.

ELASTOMERS

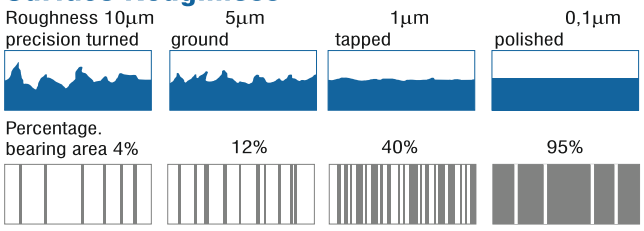
Generally seal face materials easily withstand high temperatures, typically 330°C. However temperature limitations on the part of secondary elastomers decide the seal temperature capability.

So while selecting the seal these limits are to be taken into account.

Material description	min	Temperature limits	max
Fluoroelastomer	0°F/-18°C		400°F/204°C
Ethylene Propylene (EPDM)	-40°F/-40°C		300°F/149°C
Neoprene	-40°F/-40°C		300°F/140°C
Nitrile Butadiene (Buna N)	-40°F/-40°C		300°F/125°C
Kalrez® 1050LF	240°F/-7°C		550°F/288°C
PTFE	-100°F/-73°C		450°F/232°C
Flexible graphite	-320°F/-196°C		800°F/427°C
Chemraz®	-20°F/-29°C		450°F/310°C

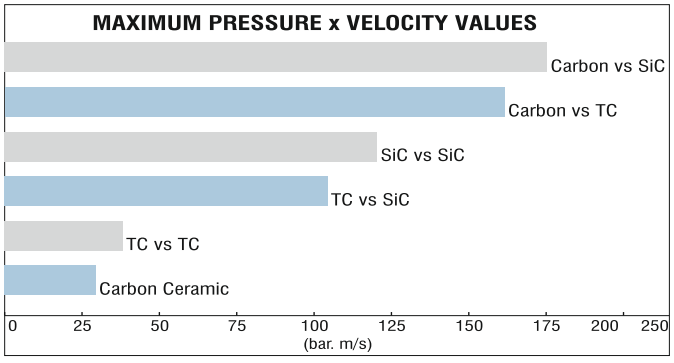
Material	Compressive Strength N/mm²	Density g/cm³	Modulus Elasticity of kN/mm²	Coeff. of Thermal Expansion x10-⁶/°C	Thermal Conductivity W/m°C	Hardness
Carbon, resin impregnated	250	1.83	234	2.88	6	100*
Carbon, antimony impregnated	350	2.15	262	3.96	8	115*
Tungsten Carbide	4750	15	635	5	100	1500*
Silicon Carbide	2750	3.1	365	4.5	145	2400*
Alumina Oxide	2620	3.9	385	4.32	25	1800**

Surface Roughness



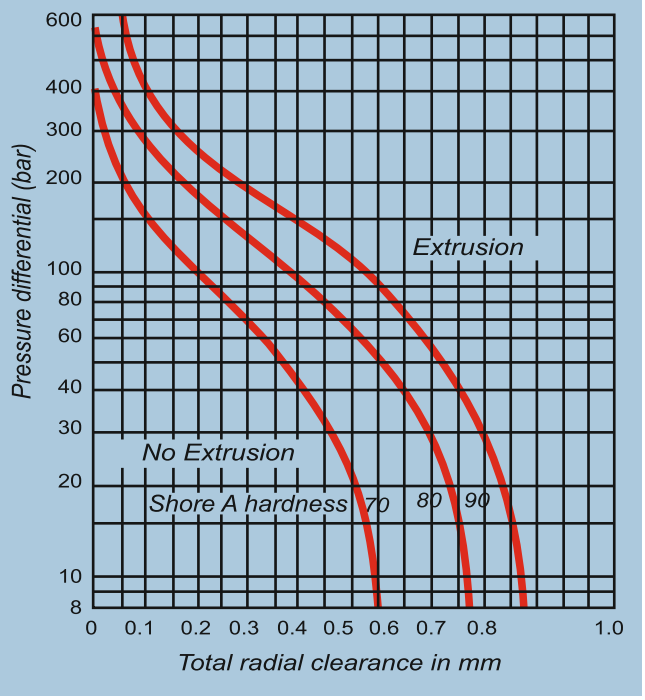
Lapped sliding face made out of different materials having the following average, arithmetic mean roughness values (Ra)

Tungsten carbide	0.01µmm
Silicon carbide	0.04µmm
Carbon graphite	0.10µmm
Aluminium oxide	0.15µmm



Extrusion characteristics of elastomeric O-rings

The extrusion resistance of elastomeric O-rings can be greatly enhanced by use of support rings.



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MECHANICAL SEAL REFURBISHMENT

Acusense Seal Repair Facility is a dedicated unit specialising in the repair or replacement of all makes and types of Mechanical Seals and associated components.

- **Our comprehensive service offers the following significant advantages:**

Price

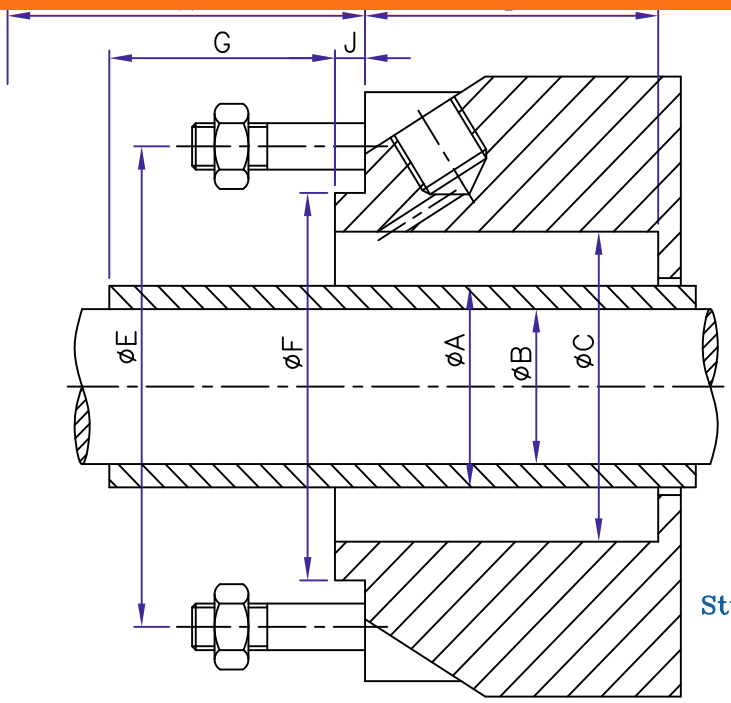
- Acu Sens quote and price based upon the work to be done rather than the industry norm of a set percentage of new.
- In-house production of faces from raw powder and new components in volume provide cost savings and rapid service.
- Acu Sens repair customers thus pay industry leading fair prices, without skimping or sacrifice to Quality, Repair Process and Detail.

Qyality

- All components manufactured by NB Acu Sens
- The refurbishment of each seal assembly is carefully controlled by Process and Job Specification Sheets, which are provided to you upon quotation and delivery.
- Acu Sens are dedicated to providing a quality “as new” repair. All seals are pressure tested, upon request on order.

Service

- Same day repair service, when necessary and technically possible.
- Fast service is the norm backed by extensive stocks of materials, components and replacement new seals.
- Total Commitment to Customer Service



INFORMATION DATA SHEET

A. Sleeve O.D. .....
B. Shaft O.D. .....
C. Stuffing Box Bore .....
D. Depth Of St. Box .....
E. Bolt Circle .....
No. Of Bolts .....
Size Of Bolts .....
F. Collar Dia. .....
G. Sleeve Extension .....
H. Nearest Obstruction .....
J. Raised Collar .....

Stuffing Box Cover (Jacketed/Non Jacketed)

CLIENT _____

ADDRESS _____

_____

PUMP DATA

MAKE _____ TYPE _____

MODEL _____ ITEM/TAG NO: _____

CONSTR. MATL. _____ EXISTING SEAL _____

OPERATING PARAMETERS

TOTAL HEAD _____ SUC. PR. _____ DIS. PR. _____

SPEED _____ DIRECTION OF ROTATION (VIEW FROM DRIVE END) _____ CW/ACW _____

FLUID DETAILS

FLUID _____

PUMPING TEMP (PT) _____ MAX. TEMP. _____

SP. GR. AT PT _____ VISC. AT PT _____

BOILING POINT _____ FREEZING POINT _____

FLUID DESCRIPTION _____ CLEAN DIRTY ABRASIVE SLURRY TOXIC

PERCENTAGE OF SOLIDS _____ GRAIN SIZE _____

OTHER REMARKS _____

Rotary Joint Water Application

Face Materials	Carbon, Silicon Carbide, Tungsten Carbide, Stelite
Metal Parts	SS 316, SS 304, Brass
Seal Elastomer	Viton, Silicon, TTV, PTFE.
Operating Limits	SIZE : 3/8" To 6.0" Pressure : 15 Bar temperature : 150° C Speed: 3500 RPM

Rotary Joint for Air Application

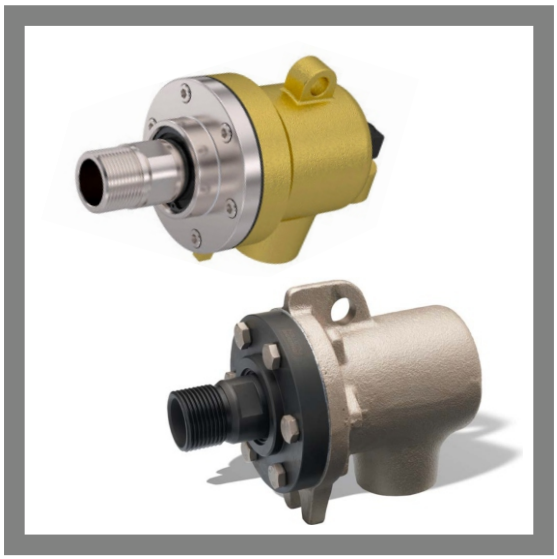
Face Materials	Carbon, Silicon Carbide, Tungsten Carbide, Stelite,
Metal Parts	Aluminium
Seal Elastomer	Viton, PTFE.
Operating Limits	SIZE : 3/8" To 6.0" Pressure : 10 Bar Air, 0.07 Bar to 7 Kpa Vaccum Temperature : 150° C Speed: 2800 RPM

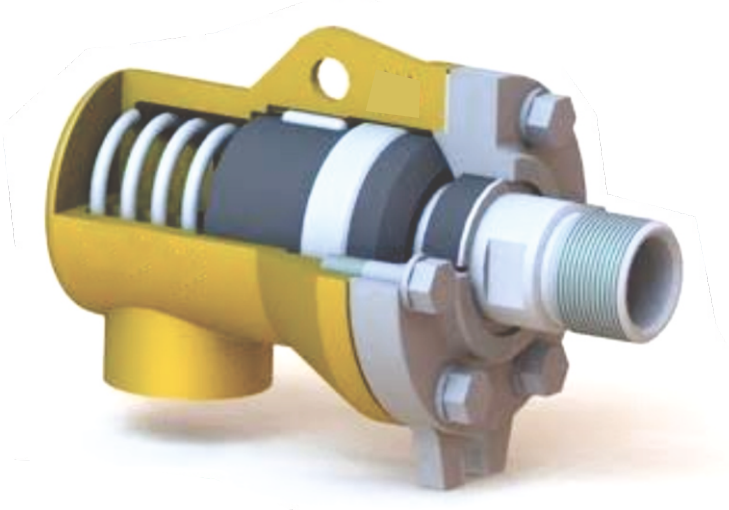
Hydraulic Rotary Joint

Face Materials	Carbon, Silicon Carbide.
Metal Parts	SS 316, SS 304, Brass, Gun Metal.
Seal Elastomer	Viton, PTFE.
Operating Limits	SIZE : 3/8" To 6.0" Pressure : 400 Bar temperature : 150° C Speed: 1500 RPM

Rotary Joint for Hot Oil & Thermic Fluid

Face Materials	Antimony Carbon.
Metal Parts	MS, SS 304
Seal Elastomer	Grafoil Gasket, Asbestos Gasket.
Operating Limits	SIZE : 0.5" to 6.0" Pressure : 07 Bar Temperature : 350° C Speed: 750 RPM





Industries We Serve

- ✓ Chemicals
- ✓ Pharmaceuticals
- ✓ Petrochemicals
- ✓ Fertilizers
- ✓ Power Plants
- ✓ Marines
- ✓ Foods & Beverages
- ✓ Refineries
- ✓ Pulp & Papers

Mechvora Engineering Works

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