



Pac-Seal™
Flexible Solutions for OEMs and Volume Based Business



Experience In Motion



The power of Flowserve

As a unit of Flowserve, Pac-Seal is part of the recognized leader in supplying flow control solutions around the world. Pac-Seal draws on the experience and knowledge of more than 200 years of heritage product experience and thousands of Flowserve associates worldwide. Through this network of engineering and manufacturing expertise, you are connected to a sealing solution to exactly meet your specific requirements.

Customer-centric approach

Pac-Seal prides itself on making each customer experience unique. We don't have a one size fits all product. Instead, we recognize that each customer has specific needs. The combination of years of experience and customer collaboration allows Pac-Seal to create value driven solutions that are unique to our customer's specific needs.

With an ingrained culture of continuous improvement, Pac-Seal constantly challenges the status quo to ensure that our solutions continue to add value and meet ever-changing market demands.

Integrated application approach

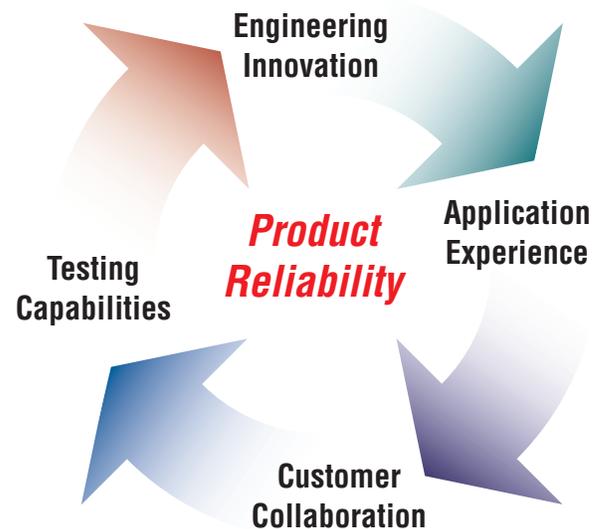
Traditional Sales and Application Engineering departments are merged at Pac-Seal to form a collaborative team focused on our customer. This team approach facilitates communication, creating total value based solutions to enhance products and customer production. Some benefits of total value based solutions include:

- Increased product life
- Reduced warranty costs
- Improved inventory metrics
- Reduced product and packaging scrap
- Reduced installation cycle times

Technical resources

As part of Flowserve, Pac-Seal has access to industry leading technical resources including:

- Finite Element Analysis (FEA)
- Computational Fluid Dynamics (CFD)
- Seal and system failure analysis
- Extensive test lab capabilities to recreate customer conditions
- Local technical support and consulting
- 2D/3D CAD modeling
- Contacting and non-contacting multi-surface profiling





Seal excellence starts with superior design and materials

Pac-Seal utilizes the latest engineering technology to analyze and design solutions for our customer's most challenging applications. Our experience with diverse materials including elastomers, plastics, exotic alloys and seal face materials makes Pac-Seal an industry leader focused on Total Cost of Ownership.

The Promise of Quality

Pac-Seal is committed to providing quality products that meet and exceed the expectations of our customers. In addition to our internal Quality Procedures, Pac-Seal is a dual certified TS16949 and ISO 9001 registered organization. Pac-Seal is dedicated to Continuous Improvement Programs and utilizes Flowserve's CIP training and resources to maximize Quality.

Flexible inventory, logistics and packaging solutions

Pac-Seal understands that our customers need complete solutions with flexibility in inventory, logistics and packaging. As a unique business unit within Flowserve, Pac-Seal can collaborate with our customers to tailor specific solutions including:

- Kanban
- Vendor managed inventory (VMI)
- Bulk packaging
- Custom part marking
- Private labels
- White boxes
- Special bar coding
- Blanket orders
- Web based order entry

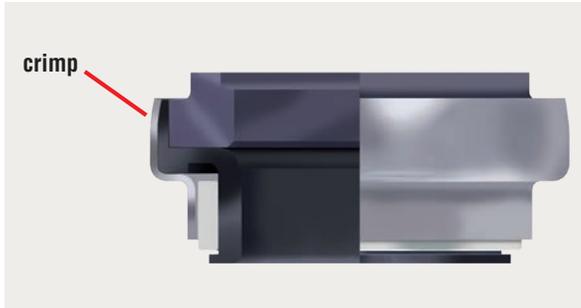
Market Experience

Customers need proven solutions in today's highly competitive marketplace. Pac-Seal provides innovative and proven products for the following pump markets:

- Swimming pool/Spa
- Well
- Automotive
- General industrial
- Positive displacement
- Appliance
- Refrigeration
- Agricultural
- Construction
- On/off highway
- Chemical
- API
- Marine
- Mining
- Cryogenics
- Locomotive

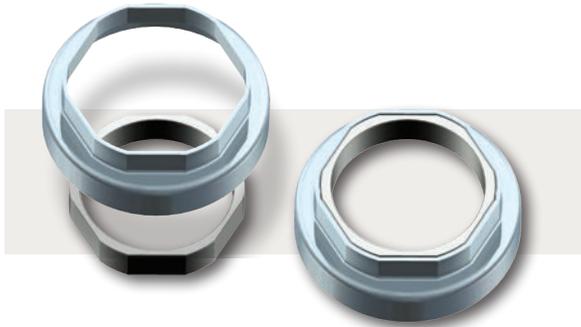


Unique design features deliver significant performance benefits



Crimped-head rotary unit

- Unitizes the rotary unit for trouble-free installation and removes metal contact from the seal ring for long-term stability
- Prevents foreign material from collecting under the bellows and dislodging the seal ring
- Allows the rotary unit to withstand higher pressures and shaft speeds



Unique hex-torque drive system

- Provides a distributed drive loading around the seal's outer shell resulting in an improved drive system and longer life

Product innovation

ASP - Advanced Stationary Pusher

- Robust drive mechanism handles high levels of torsional vibration
- Dynamic O-ring controls seal loading and improves thermal conductivity
- Single wave spring reduces axial length and further controls seal loads

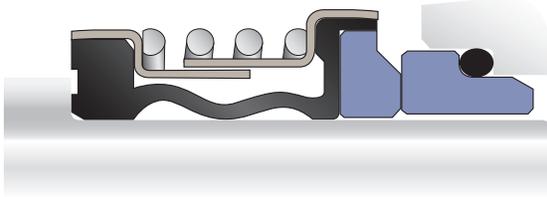


ARB - Advanced Rotating Bellows

- Customized elastomer bellows, provides the highest standard pressure capability of any elastomer bellows seal
- Robust drive mechanism reduces torsional loads on the bellows
- Fully unitized design simplifies installation and eliminates individual component handling



ARB



Description

Heavy duty, single spring, high pressure, rotating compression unit with elastomer bellows

Applications

Diesel locomotive, booster, mining, oilfield, waste water, compressor

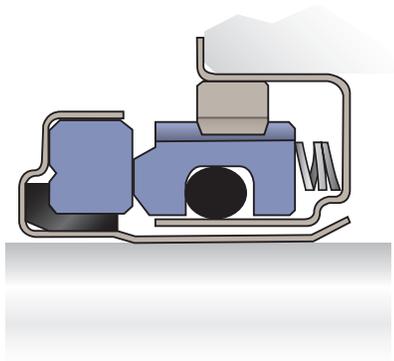
Operating Parameters

Pressure up to 27 bar (400 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

ASP



Description

Heavy duty, stationary pusher, fully unitized, wave spring

Applications

Diesel water pumps

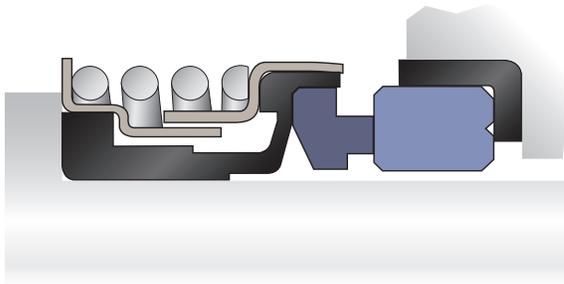
Operating Parameters

Pressure up to 5 bar (75 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

Type 16



Description

Light duty, single spring, rotating compression unit with elastomer bellows

Applications

Pool/spa, well, sump, positive displacement, food/beverage

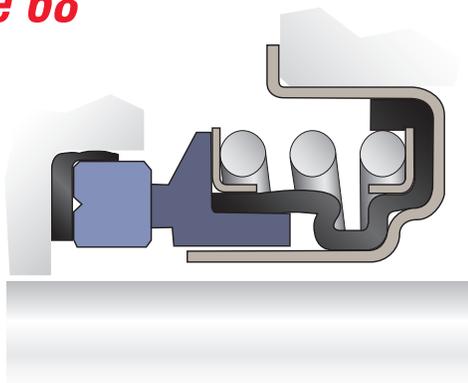
Operating Parameters

Pressure up to 10 bar (150 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

Type 68



Description

Light duty, single spring, stationary compression unit with elastomer bellows

Applications

Diesel water pump, pool/spa, well, sump, circulating, appliance

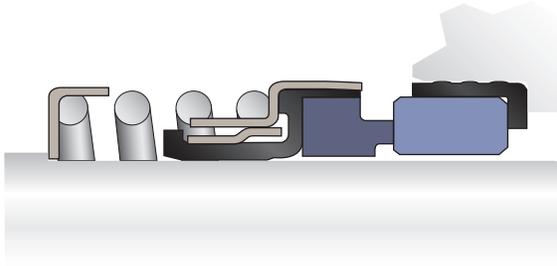
Operating Parameters

Pressure up to 5 bar (75 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

Type 21



Description

Medium duty, single spring, soft face, rotating compression unit with elastomer bellows

Applications

Circulating, well, cooking oil, compressor, positive displacement, food/beverage

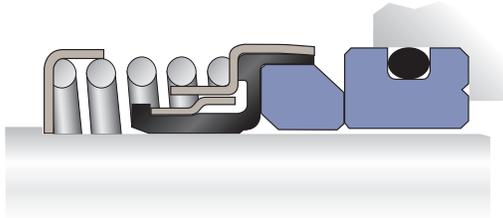
Operating Parameters

Pressure up to 17 bar (250 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

Type 31



Description

Medium duty, single spring, hard face, rotating compression unit with elastomer bellows

Applications

Construction, circulating, oilfield, compressor, mining, sump, positive displacement

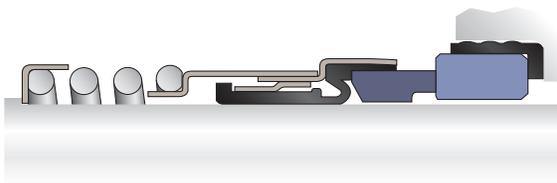
Operating Parameters

Pressure up to 17 bar (250 psi)

Speed up to 25 m/s (82 fps)

Temperature -48 to 205°C (-55 to 400°F)

Type 51



Description

Narrow cross section, single spring, rotating compression unit with elastomer bellows

Applications

Marine, slurry, waste water, chemical, compressor

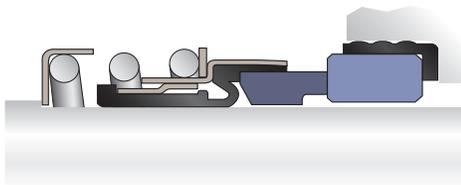
Operating Parameters

Pressure up to 10 bar (150 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

Type 52



Description

Short length, narrow cross section, single spring, rotating compression unit with elastomer bellows

Applications

Marine, slurry, waste water, chemical, compressor

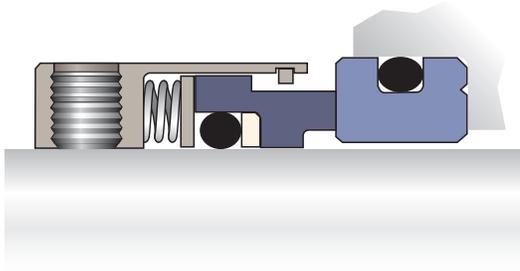
Operating Parameters

Pressure up to 10 bar (150 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

Type 8/8T



Description

Heavy duty, multi-spring, rotating compression unit with o-ring secondary seal

Applications

Agricultural, construction, circulating, well, oilfield, mining, sump, chemical

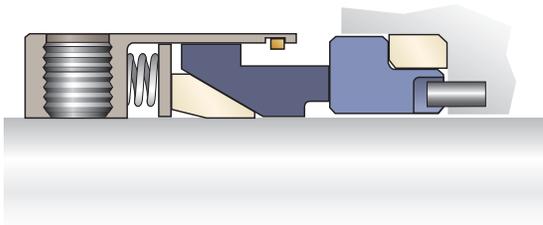
Operating Parameters

Pressure up to 17 bar (250 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)

Type 9/9T



Description

Heavy duty, multi-spring, rotating compression unit with PTFE secondary seal

Applications

Chemical

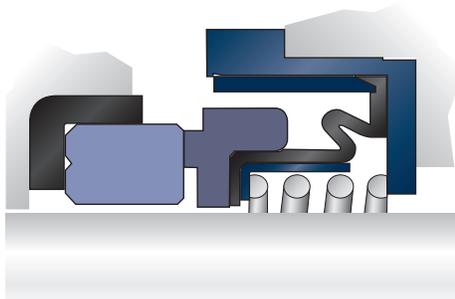
Operating Parameters

Pressure up to 17 bar (250 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 260°C (-40 to 500°F)

Type 29



Description

Light duty, corrosion resistant plastic, non-wetted single spring, stationary compression unit with elastomer bellows

Applications

Highly corrosive, non-metallic, chemical

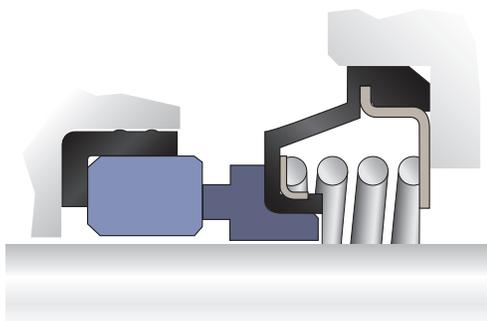
Operating Parameters

Pressure up to 5.0 bar (75 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 93°C (-40 to 200°F)

Type 40



Description

Light duty, externally mounted, single spring, stationary compression unit with elastomer bellows

Applications

Dairy, food/beverage, sanitary

Operating Parameters

Pressure up to 5.0 bar (75 psi)

Speed up to 25 m/s (82 fps)

Temperature -40 to 205°C (-40 to 400°F)



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