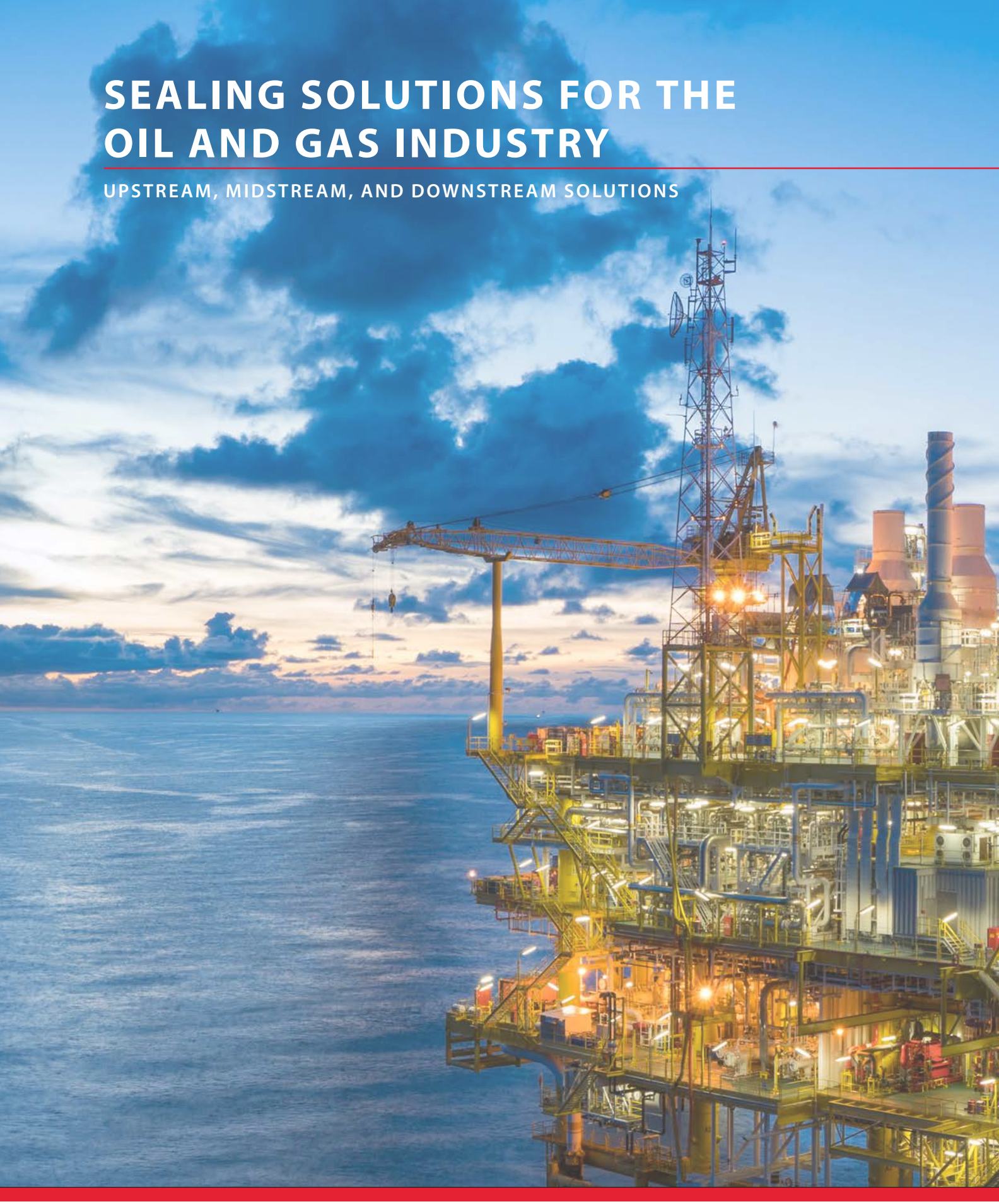
SEALING SOLUTIONS FOR THE OIL AND GAS INDUSTRY

UPSTREAM, MIDSTREAM, AND DOWNSTREAM SOLUTIONS



CHESTERTON
CUSTOMSEAL

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Important Note: *This Catalog provides general guidelines and general information about product operating conditions and product options for experienced users to consider. Operating conditions not referred to in this catalogue may affect product selection and/or product performance. This Catalog should not be considered advice, a guarantee of product performance, or a replacement for addressing product application questions with a qualified professional. Chesterton Customseal and its affiliates assume no responsibility for any action or inaction you take based on or made in reliance on the information contained in this document.*

We are Chesterton Customseal part of Chesterton® group of companies

Visit us at chestertoncustomseal.com.au

At Chesterton Customseal, we produce high-performance elastomeric and plastic polymer seals designed for use in various hydraulic, pneumatic and rotary equipment.

Our solutions range from a vast collection of standardised polymeric seals to customised solutions designed for specific applications to always provide an optimal product to our customers.
Our fully integrated state-of-the-art production facility relies on advanced computer-controlled equipment combined with flexible tools and semi-finished material to offer a wide selection of proven designs and a wide range of high-performance materials with capabilities of providing same-day shipping.
The real strength of Chesterton Customseal stems from the depth of industry knowledge and quality of the skills and experience that our technical-leading team has.

This experience triggers our ability to implement economic and innovative solutions, always in support of a professional and transparent service for our clients.

Chesterton Polymer Seals Program

Chesterton Customseal provides Chesterton polymer seals

Speed of Service

Dedicated Service Centers

Chesterton® is a technology leader in the polymer seal industry. Our SpeedSeal™ capability brings same-day service of this advanced technology to customers worldwide.

Strategically located and integrated service centres use innovative manufacturing methods to provide you with a broad selection of proven designs and a wide range of high-performance materials.

Superior Materials

Chesterton's world-renowned materials are widely considered to be the highest-performing polyurethane materials for heavy-duty fluid power applications on the market today.

In addition, we utilize a full range of advanced materials for the most demanding applications.

- Polyurethanes
- Elastomers
- Engineered plastics
- Metal Detectable (MDx)

Engineered Solutions

High Performance Custom Seals

We leverage our engineering experience in design and materials to develop custom seals that solve today's most difficult sealing challenges.

Our custom designs provide leading-edge technology that has been used around the world with documented success and recognition.

Equipment Upgrade

Systematic Approach to Improve Mean Time between Repair (MTBR) and Reduce Mean Time to Repair (MTTR)

Chesterton's equipment upgrade program applies a systematic approach to improving seal performance during the repair and overhaul of equipment. This approach, combined with high-performance sealing products and systems, will assist in improving equipment reliability, availability, and performance productivity.

One-stop Solutions

Wide Range of Product Portfolio

We specialize in developing, designing, and manufacturing system solutions tailor-made to customers' requirements.

We provide polymer sealing solutions that meet the needs of fluid power equipment in reciprocating, rotating, or oscillating motion.

Customer Support

Global Solutions, Local Service

Chesterton's skilled field specialists collaborate with customers to understand their needs and provide the best solutions for their applications.

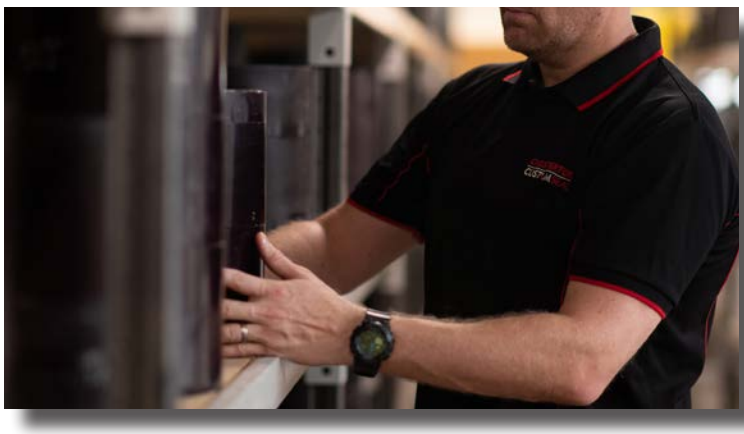
Our local service is supported by a global distribution and logistics network that enables us to reach and react to the shifting needs of customers worldwide.

Training Programs

The Know-How Advantage

Build a skilled workforce of fluid power equipment specialists by applying Chesterton's maintenance and operational best practices to impact reliability, efficiency, and life cycle costs.

Chesterton has been in the business of providing knowledge of this type for decades and can assist you with your training and development needs.



Sealing Solutions in the Oil and Gas Industry

Oil and Gas industry present an ever-increasing challenge for equipment. Effective seals are critical to equipment integrity, and must operate at more extreme pressures and temperatures than ever before.

The quality and reliability of seals is crucial. They not only directly affect performance and maintenance intervals, but their integrity is critical for the safety of all who work within the vicinity.

Within the Oil and Gas sector, extremes of all kinds aren't the exception – they're the normality.

THE CHALLENGE

The demands placed upon seals have increased dramatically as the recovery of oil, gas, and hydrocarbons has increased in complexity. The standard seals relied upon for so long are no longer fit for purpose, meaning advanced materials and design are essential for safe and efficient operation.

Some of the challenges that seals are under include:

- Extreme temperatures and pressures (HPHT)
- Aggressive chemicals
- Rapid gas decompression (RGD)
- Sour gas (H2S)

The chemical environments that seals must withstand are particularly diverse, including exposure to methanol, amines, steam, supercritical CO2, hydrogen sulphide, drilling muds, natural gas and oil.

For decades, Chesterton Customseal has been a leading supplier of innovative sealing solutions that help our customers in the Oil and Gas industry improve the reliability and availability of their rotating equipment.

MATERIAL SOLUTIONS

The search for effective seals capable of enduring the relentless rigours of the Oil and Gas exploration, discovery, completion, and production environment begins with carefully selecting materials and a precise seal design. Certain polymers strengthen and bring longevity to seals under constant challenges from extreme conditions. Among them, PTFE (Polytetrafluoroethylene) and PEEK-based materials have risen to prominence for their exceptional performance attributes.

PTFE: Defying Chemical Challenges
PTFE, recognized for its excellent chemical resistance, offers outstanding protection against the corrosive forces encountered in the industry.
Its ability to withstand high temperatures, coupled with remarkable resistance to a spectrum of chemicals, positions it as an ideal choice for sealing solutions. PTFE-based seals can provide a formidable defence against chemical aggressors.

PEEK: Resilience in the Face of Adversity
PEEK-based materials, celebrated for their durability and hard-wearing nature, help guard against acids, organics, and bases. In these demanding environments, PEEK-based seals contribute to extended Mean Time Between Failure (MTBF), reducing maintenance tasks and unplanned shutdowns that can significantly impact the industry's bottom line.

Elastomers: Flexibility and Adaptability

Elastomers play a crucial role in sealing solutions. Known for their flexibility and adaptability, elastomers offer reliable sealing performance in various conditions. Their ability to conform to different surfaces and accommodate dynamic movements makes them valuable components in sealing applications across the industry.

Chesterton Customseal, a pioneering leader in innovative sealing solutions, harnesses the exceptional attributes of PTFE, PEEK-based materials, and elastomers through cutting-edge seal designs. This powerful combination yields a range of seals, both standardized and customized, that find effective application throughout the industry's diverse spectrum.

STANDARDS AND REGULATIONS

Our production and quality processes are independently controlled by the International Organization for Standardization (ISO). We are ISO 9001: 2015 certified, which covers the quality management system for producing seals and seal kits for hydraulic, pneumatic, rotary and static applications.

We constantly focus on improving customer experience, aiming to provide the best service and product on the market, with an eye always open to continuous improvement and sustainability.

ISO 9001 QUALITY ISO 45001 SAFETY ISO 14001 ENVIRONMENT

Chesterton Customseal offers specialized engineering support, aligning seal development with Oil and Gas installation specifications for industry-standard compliance.

We collaborate with clients to identify precise solutions, accounting for API, ATEX, NORSOK, ABS, DNV, and other regulations. Choose from our range of ready-to-use products and tailored solutions to enhance project success. Our selected materials adhere to top industry standards, featuring certifications like NORSOK M710 and API 6A compliance for added assurance*.

**Material certification is provided upon request.*

APPLICATIONS

Artificial Lift
Boosting reservoir pressure demands robust sealing solutions. Our seals are designed to excel in gas lifts, electrical submersible pumps, and hydraulic systems.
Their abrasion resistance capabilities and superior hydraulic sealing help enhance productivity and equipment longevity.

Chemical Injection
Our sealing solutions for the Oil and Gas industry offer exceptional chemical inertness and compatibility with diverse substances. With low-friction reciprocation and high-pressure sealing, Chesterton Customseal seals boost efficiency, reduce wear, and prevent hazardous leaks in chemical injection reciprocating pumps.

Completion Tools
Well completion requires relentless sealing performance. High-pressure, high-temperature seals shine in perforating systems, production packers, and flow control, ensuring reliable and secure well completion.

Directional Drilling
Directional drilling enhances reservoir exposure by accessing oil or gas reserves at non-vertical angles. Reliable equipment like rotary steerable systems, measurement while drilling (MWD) tools, drilling motors, and logging equipment requires robust sealing solutions. Chesterton Customseal seals offer outstanding performance in high-temperature and high-pressure conditions, resisting rapid gas decompression (RGD) for prolonged efficiency. Our seals can significantly enhance directional drilling operations, supporting reservoir access and extraction goals.

Engineered Valves
Our seals offer a wide temperature range, resisting chemical corrosion and minimizing friction for extended valve life. Energy-efficient and durable, Chesterton Customseal sealing solutions can elevate the performance of flow control systems.

Liquefied Natural Gas (LNG)
Cryogenic equipment faces extreme conditions. Operating seamlessly at low temperatures, our seals are designed to resist rapid gas decompression and allow for the safe handling of liquefied natural gas.

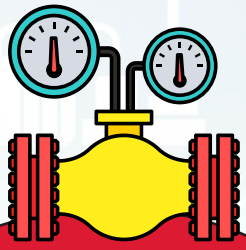
Swivel Systems
Innovative swivel systems rely on high-performance seals for low-friction performance, chemical resistance, and longevity. Chesterton Customseal seals offer smooth fluid transfer in land and marine settings, a crucial aspect of Oil

Premium Materials

Upstream

Chesterton Customseal offers high-performance sealing solutions for Oil and Gas exploration. Our advanced seals withstand extreme temperatures, pressures, and harsh chemicals, improving safety and efficiency.
Our seals are meticulously engineered to resist rapid gas decompression, acid, gases, and the aggressive chemicals intrinsic to oil field fluids.

Exploration and Production



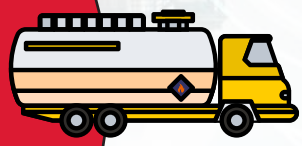
Midstream

Sealing solutions are key in maintaining efficiency and reliability in the midstream phase, where the connection between upstream and downstream operations occurs. Chesterton Customseal's expertise shines through in developing elastomer sealing materials tailored to high temperatures, pressures, and fluctuating chemical environments. These seals aid in reducing emissions, conserving energy, and extending the lifespan of critical assets.

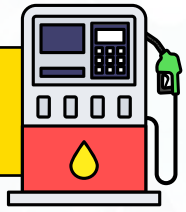
Processing, Storage and Transportation

Downstream

Refining and distribution activities in the downstream sector face various challenges with corrosion. Chesterton Customseal has extensive experience with materials like FKM and HNBR and offers innovative sealing solutions that thrive in these aggressive settings.



Refining and Retail



UNIQUE MATERIALS AND DESIGN FOR THE OIL AND GAS INDUSTRY

ELASTOMERS					
Material	Color	Hardness	Temperature range MIN	MAX (°C)	Description
NBR AWC742	BLACK	85A	-30	110	AWC742 from Chesterton Customseal is an excellent choice for the Oil and Gas sector and an ideal option for machined O-rings, seals, and custom designs. It is suitable for tough conditions like low temperatures and rapid gas decompression. This material ensures traceable quality from raw compound to cure date, backed by Chesterton Customseal's quality assurance.
HNBR AWC743	GREEN	85A	-20	150	HNBR - AWC743, a prevalent compound in the Oil and Gas sector, is recognized for excellent chemical resistance. It is a hydrogenated nitrile, ideal for sour gas service. Norsok M710 Annex B approved, it is suitable for rapid gas decompression. Utilizing Chesterton's specialized manufacturing, we can create custom seal shapes and sizes to match your requirements.
HNBR ED	BLACK	85A	-15	150	HNBR ED Black offers exceptional RGD resistance for reliable seals in critical Oil and Gas applications. 1. RGD Test: HNBR ED Black undergoes gas exposure (90% methane, 10% carbon dioxide) to assess rapid decompression resilience. 2. NORSOK M710 Certified: Meets stringent durability standards for Oil and Gas industry elastomers.
EPDM AWC750	BLACK	85A	-20	220	EPDM is an ideal sealant from Chesterton Customseal for the Oil and Gas industry. Its UV resistance suits applications with sunlight exposure. This material is very versatile and can be used to form O-rings, seals, and more. At 85A hardness, it offers outstanding performance in Oil and Gas applications, remaining intact under sunlight.
FKM AWC701	BROWN	82A	-20	220	FKM, a fluorinated rubber elastomer, can excel in environments exposed to in heat, chemicals, and atmospheric resistance. Norsok M710 Annex B approved, this material is an ideal option for tough Oil and Gas tasks, offering wide temperature range and superior chemical durability. It is a top choice for various equipment, enhancing seal reliability and efficiency.
FKM ED	BLACK	85A	-20	220	The FKM ED material, tailored for Oil and Gas applications, passes tough NORSOK M710 tests. It offers protection against oils, hydrocarbons, and HFD fluids, yielding reliable seal performance.
FKM AWC704	BLACK	85A	-20	210	This premium FKM material is known for its strong chemical resistance capabilities, high temperature tolerance, reliable sealing, robust mechanical strength, and adherence to industry standards. Ideal for demanding Oil and Gas applications requiring toughness and dependability.
FEPM AWC727	BLACK	85A	-5	200	Chesterton Customseal offers FEPM TFE/P AFLA rubber, an ideal material for Oil and Gas industries. This material exhibits chemical-resistant, properties and can be used to machine for machined O-rings and customised seals in our warehouse.

This table summarizes the typical physical properties of common seal materials. The data and information are intended only as a guide to be used.

THERMOPLASTIC				
Material	**Color**	**Temperature range MIN MAX (°C)**		**Description**
PEEK AWC630	TAN	-45	175	Virgin PEEK AWC630 is tough, reliable, and dimensionally stable, even under continuous elevated temperatures. It offers excellent wear characteristics for seals and wear rings. Unfilled.
PEEK AWC635	WHITE	-45	175	PEEK AWC635 is an advanced material with excellent resistance to high temperatures, harsh chemicals, and mechanical stress. It is ideal for critical applications like sealing solutions, wellbore equipment, and downhole tools. Its durability helps prolong prolonged equipment life, reduce maintenance, and enhance operational efficiency in extreme conditions.
PTFE AWC100	DARK YELLOW	-200	260	PTFE Polyimide filled AWC100 offers exceptional chemical resistance and low friction, making it ideal for demanding conditions and aggressive chemicals. It offers reliable sealing, reducing downtime and enhancing efficiency in critical Oil and Gas operations.
PTFE AWC300	GREY	-200	260	This PTFE Glass / Moly filled material can resist high temperatures, chemicals, and tough industry conditions. Its low friction and self-lubrication cut wear, help extend equipment life. PTFE AWC300 offers reliable sealing, reducing leaks for efficient operations. A dependable solution enhancing performance, safety, and productivity in Oil and Gas applications.
PTFE AWC400	BLACK	-200	260	This PTFE Carbon / Graphite filled AWC400 performs well in high temperatures and chemical resistance for Oil and Gas applications. Low friction extends seal life, making it a cost-effective choice for critical equipment like pumps, valves, and compressors.
PTFE AWC500	BRONZE	-200	260	PTFE Bronze filled AWC500 offers superior chemical resistance, low friction, and durability for Oil and Gas applications, and reliable performance.
PTFE AWC530	CREAM	-200	260	Tailored for use Oil and Gas, this material is capable of handling tough conditions – aggressive substances, high pressures, and extreme heat. Its durable properties help yield dependable seals, reducing leak and downtime risks in crucial operations. Chesterton's PTFE Ekonol® filled AWC530 performs well in challenging settings, boosting efficiency and safety in Oil and Gas processes.

This table summarizes the typical physical properties of common seal materials. The data and information are intended only as a guide to be used.
Ekonol® is a registered trademark of Saint-Gobain Ceramics & Plastics, Inc

The Oil and Gas industry continues to build capacity to meet increasingly stringent industry demands, reduce fugitive emissions, and lower production costs.

Today's refineries face ever-changing health, safety, and environmental requirements that impact product specifications and require significant capital investment and attention.
Chesterton Customseal offers materials that meet stringent emissions requirements and are well suited to this industry's high temperatures, high pressures, and widely varying chemical environments.
Extreme temperatures, harsh environmental conditions, corrosive seawater, chemical exposure, and high friction and wear requirements in the Oil and Gas industry make controlled operation one of the greatest challenges from an engineering standpoint.

Chesterton Customseal's high-performance polymers offer many advantages due to their their lightweight properties, cost efficiency, durability, and resistance to high temperatures, moisture, chemicals and deterioration. Our materials help improve performance and reduce downtimes, adding outstanding value wherever they are applied: oil refining or hydraulic fracturing operations, underground or in subsea systems, wells, or rigs and exploration.
Chesterton Customseal's experts are here to examine your specific prerequisites and needs, guiding you through the process of selecting the most suitable materials for your Oil and Gas applications. We offer a wide range of high-performance materials to drive your operations to the next level of efficiency, safety, and reliability.

Spring Energised Seals in the Oil and Gas Industry

WHY SPRING ENERGISED SEALS ARE CRUCIAL FOR TODAY'S OIL GAS INDUSTRY

In the dynamic and demanding world of industry today, the investigation for reliable and efficient sealing solutions has become more crucial than ever. This is precisely where Chesterton Customseal, a premier provider of sealing solutions, comes into play. With a legacy spanning various sectors, Chesterton Customseal has become the go-to choice for customers searching for high-quality Spring-Energised Seals tailored to tackle even the toughest challenges in the Oil and Gas industry.

When faced with extreme sealing obstacles, Chesterton Customseal is a committed ally. Our Spring-Energised Seals are precision-engineered to meet and exceed expectations in applications where meticulous sealing is of utmost importance. Whether it's braving cryogenic temperatures as low as -180°C (-292°F) or enduring scorching heat up to 260°C (500°F), our Spring-Energised Seals consistently deliver unparalleled performance.

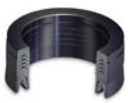
SPRING-ENERGISED SEAL REQUIREMENTS OFFERS A MULTITUDE OF DISTINCT ADVANTAGES

- **Flexible Manufacturing**: Our expertise spans a wide spectrum, accommodating small and extra-large diameters, providing a tailored solution for your needs.
- **Quick Prototyping**: With a focus on agility, we offer rapid prototyping to swiftly materialise and validate your sealing solutions.
- **Short Lead Times**: Time is of the essence, and we prioritise delivering solutions promptly, minimizing downtime.
- **Responsive Engineering Support**: Our engineering experts are available, with application expertise and advanced finite element analysis support.
- **Engineer-to-Engineer Contact**: We foster direct communication between engineers, promoting a collaborative and streamlined development process.
- **Custom Solutions**: At Chesterton Customseal, we understand that each application is unique. Our commitment to tailored solutions taking care that your precise requirements are met.

SPRING ENERGISED SEALS EXCELLING IN DIVERSE APPLICATIONS

Chesterton® Spring Energised Seals excel across an array of demanding applications, including:

- Cryogenic environments range from -180°C (-292°F) to high temperatures of 260°C (500°F).
- Thriving under vacuum conditions to enduring high pressures of up to 1,380 bar g (20,000 psi).
- Demonstrating impressive resistance across a broad spectrum of chemicals (pH 0 – 14).
- Enabling dynamic sealing for static, reciprocating, rotating, and oscillating applications.
- Withstanding rapid gas decompression (RGD) and minimising outgassing.
- Delivering low friction performance even without lubrication.
- Exhibiting remarkable compression set resistance, ensuring consistent sealing integrity.

	Seal	Description
Series 100		Series 100 includes a V-shaped spring with a linear load curve and wide deflection range which makes this our most versatile model. Good for highly dynamic reciprocating and rotary applications.
Series 200		Series 200 consists of a canted coil spring which allows for minimal deflection while applying low load. Good for rotary, reciprocating, and static applications where compensation for loose tolerances or a miniature seal is required.
Series 300		Series 300 includes a flat ribbon coil spring with high load versus deflection range which provides extremely tight sealing. Good for cryogenic and vacuum applications at static or slow speed.
Series 500		High performance, multi-purpose stacked SES and V-Ring set. Accommodates hardware with deep stuffing boxes.
Series 600		Consists of a U-shaped, heavy-duty, high-load spring that is best for challenging static sealing conditions. Good for static and slow oscillating motion, particularly under cryogenic and vacuum conditions or where gas leakage is a particular issue.

Innovative Sealing Solutions

20KD Face and Static Seals

High Performance O-Ring Upgrade for Static Sealing

Chesterton® 20K D-Ring is a continuous compression seal designed for static applications and is often applied as an upgrade from conventional face seals or O-Ring designs. That is why 20K D-Rings are interchangeable for O-Ring housing and O-Ring designs with backup rings. 20K D-Ring design provides excellent performance in static hydraulic or pneumatic equipment applications, including flange and valve control units.

The optimum design provides minimum seal deformation by better fit in the seal cavity and excellent pressure distribution through the seal cross-section by working with better geometrical and dimensional stability. 20K D-Rings can withstand higher operating pressure compared to conventional O-Rings.

- Upgrade performance of conventional face seal and O-Ring designs
- Superior wear and extrusion resistance versus conventional materials
- Low compression set characteristics
- Unique manufacturing process allows the flexibility to create customised size
- Sizes made to accommodate international standards including ISO

R20KDEAR rod seal featuring AWC520 backup rings enhances the material's resistance to extrusion while preserving the integrity of the seal.

PRODUCT PROFILES

R20KDR | 20KDRFS | P20KDR | OR1 | 20K0R | OR

SPECIFICATIONS

Material (designation)	Size Range* mm (inch)	Temperature °C (°F)	Pressure MPa (psi)
AWC704 (FKM)	6 – 304.8 (1/4 – 12)	-30 – 200 (-20 – 400)	16 (2320)
AWC743 (FKM)	6 – 304.8 (1/4 – 12)	-20 – 150 (-4 – 300)	16 (2320)
AWC800 (EU)	6 – 2540 (1/4 – 100)	-50 – 85 (-60 – 185)	103.5 (15000)
AWC808 (AU)	6 – 400 (1/4 – 15.75)	-20 – 85 (-4 – 185)	40 (5800)
AWC825 (EU)	6 – 2540 (1/4 – 100)	-40 – 85 (-40 – 185)	52 (7500)
AWC860 (EU)	6 – 508.0 (1/4 – 20)	-50 – 120 (-60 – 250)	103.5 (15000)

**Please contact your Chesterton Customseal representative for larger sizes.*

P22K Piston Seals

Special Geometry Provides Optimal Sealing Performance

The Chesterton® P22K is a single-acting, asymmetric, continuous U-Cup design. A unique seal lip geometry in combination with twin lip arrangement on dynamic the side provides zero leakage throughout the entire operating range, resulting in tight, bypass-free operation. The sturdy, static lip stabilizes the seal against possible rolling while the dynamic lip design minimizes potential issues associated with low-pressure sealing, provides additional stability, and eases installation.

The optimum seal design enables controlled pressure distribution through the entire seal component while the proper expansion space provides free space for deformation under pressure, optimizing seal contact area on the sliding surface.

This seal design is offered as a piston seal and provides excellent performance in light- to heavy-duty hydraulic applications. Robust seal construction makes P22K insensitive to pressure fluctuation and, in combination with high performance polyurethane materials, the seal has outstanding pressure/shock load capability.

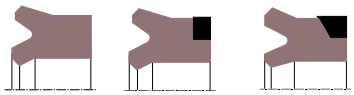
The P22K design is manufactured using a machining process which allows the flexibility to create customise size based on equipment dimensions.

A number of additional designs have been derived from the original P22K design to address specific needs and applications in the market.

These include the use of anti-extrusion rings for use in equipment with excessive clearances.

- Single-acting, U-Cup design; zero leakage throughout the entire operating range
- Abrasion-resistant design; excellent performance in hydraulic applications
- Insensitive to pressure fluctuation and excellent pressure/shock load capability
- Machining process allows the flexibility to create customised size
- Sizes made to accommodate international standards including ISO

PRODUCT PROFILES



P22K **P22KAER** **P22KAER1**

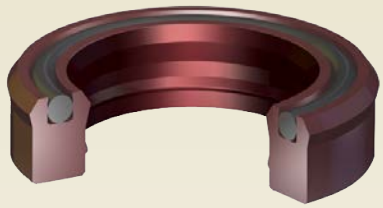
SPECIFICATIONS

Material (designation)	Size Range* mm (inch)	Temperature °C (°F)	Pressure MPa (psi)	Speed m/s (ft/min)
AWC704 (FKM	)6 – 304.8 (1/4 – 12)	-30 – 200 (-20 – 400)	16 (2320)	1.5 (300)
AWC800 (EU)	6 – 1320 (1/4 – 52)	-50 – 85 (-60 – 185)	103.5 (15000)	1 (200)
AWC808 (AU)	6 – 400 (1/4 – 15.75)	-20 – 85 (-4 – 185)	40 (5800)	0.5 (100)
AWC825 (EU)	6 – 1320 (1/4 – 52)	-40 – 85 (-40 – 185)	52 (7500)	0.5 (100)
AWC830 (EU)	6 – 254 (1/4 – 10)	-35 – 75 (-30 – 175)	52 (7500)	0.9 (185)
AWC860 (EU)	6 – 508.0 (1/4 – 20)	-50 – 120 (-60 – 250)	103.5 (15000)	1.25 (250)

**Please contact your Chesterton Customseal representative for larger sizes.*

P22KE Piston Seals

Energised Dual-component for Added Stability



The Chesterton® P22KE Piston Seal is a single-acting, continuous U-Cup design incorporating an O-Ring to increase preload capabilities.
The O-Ring energizes the seal without system pressure, helps to increase sealing force, and provides stability at higher temperature conditions. System pressure rise will increase sealing force, thus completely actuating the lips through the O-Ring.

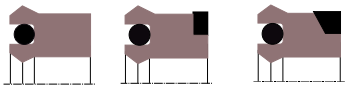
The excellent abrasion resistance and trimmed seal lips provide outstanding performance in medium- to heavy-duty hydraulic applications.
The rubber energizer cushions the seal against shock load and pressure peaks. The incorporated anti-extrusion ring helps the seal withstand transverse loads and extreme pressure conditions during operation and further increases the seal component's extrusion resistance at larger clearances. This seal design is offered as a piston seal.
The P22KE design is manufactured using a machining process that allows the flexibility to create customised size based on equipment dimensions.

- Single-acting, U-Cup design; zero leakage throughout the entire operating range
- Abrasion-resistant design; excellent performance in hydraulic applications
- Insensitive to pressure fluctuation and excellent pressure/shock load capability
- Machining process allows the flexibility to create customised size
- Sizes made to accommodate international standards including ISO

P22KE Piston seal. Crafted from high-grade NBR material, this seal is universal and tailor-made for medium to heavy-duty hydraulic applications.

22KEAER is a single-acting, continuous U-cup design combines an O-ring for increased pre-load capabilities and a back-up ring to resist extrusion. Crafted with FKM and PEEK materials, this seal offers leak-free performance even in extreme sealing conditions.

PRODUCT PROFILES



P22KE **P22KEAER** **P22KEAER1**

SPECIFICATIONS

Material (designation)	Size Range* mm (inch)	Temperature °C (°F)	Pressure MPa (psi)
AWC704 (FKM)	6 – 304.8 (1/4 – 12)	-30 – 200 (-20 – 400)	16 (2320)
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AWC808 (AU)	6 – 400 (1/4 – 15.75)	-20 – 85 (-4 – 185)	40 (5800)
AWC825 (EU)	6 – 2540 (1/4 – 100)	-40 – 85 (-40 – 185)	52 (7500)
AWC860 (EU)	6 – 508.0 (1/4 – 20)	-50 – 120 (-60 – 250)	103.5 (15000)

**Please contact your Chesterton Customseal representative for larger sizes.*

R20K Rod Seals

Heavy-duty Bidirectional, Low-Speed Hydraulic Sealing

Chesterton® R20K Rod Seal is a continuous, bidirectional compression seal with dual independent sealing points for hydraulic rod applications. The robust, durable, dual-lip profile is used for single-groove cavities in heavy-duty, high-pressure, hydraulic applications.

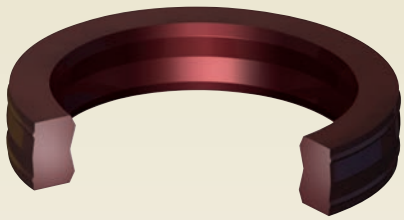
The entire seal cross section of the seal is preloaded by the seal groove when installed to ensure tight sealing even at low pressure thus preventing fluid bypass from start-up. When the system pressure increases, the hydraulic fluid energizes the seal, increasing the sealing area and sealing efficiency of the component.

The heavy-duty seal design with incorporated anti-extrusion ring helps R20K to withstand transverse loads and extreme pressure conditions, just like pressure peaks and shock load during operation and it further increases extrusion resistance of the seal component at larger clearances.

20K is an ideal solution for static and dynamic applications even in the most demanding applications.

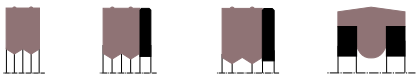
The R20K Duoseals are made from our unique machining process which eliminates the need for tooling costs associated with new sizes.

Additional designs were developed to meet specific application and equipment needs including the incorporation of various anti-extrusion devices for combating excessive clearances and pressure spikes.



- Reduces risk of fluid bypass from start-up of the hydraulic system
- Ideal replacement for 2-, 3-, or 4-piece cap seal and compression seal assemblies
- Superior extrusion, transverse load, and wear resistance
- Ideal solution for static and dynamic applications
- Unique manufacturing process allows the flexibility to create customised size

PRODUCT PROFILES



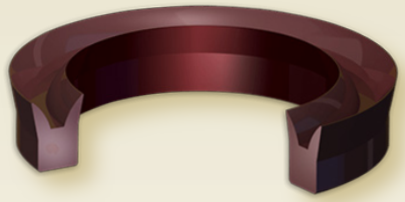
R20K1 R20K2 R20K3 R20KDAER

SPECIFICATIONS

Material (designation)	Size Range* mm (inch)	Temperature °C (°F)M	Pressure Pa (psi)	Speed m/s (ft/min)
AWC704 (FKM	)6 – 304.8 (1/4 – 12)	-30 – 200 (-20 – 400)	16 (2320)	1.5 (300)
AWC800 (EU)	6 – 2540 (1/4 – 100)	-50 – 85 (-60 – 185)	103.5 (15000)	1 (200)
AWC808 (AU)	6 – 400 (1/4 – 15.75)	-20 – 85 (-4 – 185)	40 (5800)	0.5 (100)
AWC825 (EU)	6 – 2540 (1/4 – 100)	-40 – 85 (-40 – 185)	52 (7500)	0.5 (100)
AWC830 (EU)	6 – 254 (1/4 – 10)	-35 – 75 (-30 – 175)	52 (7500)	0.9 (185)
AWC860 (EU)	6 – 508.0 (1/4 – 20)	-50 – 120 (-60 – 250)	103.5 (15000)	1.25 (250)

R22KN Rod Seals

Low Friction Design for Hydraulic and Pneumatic Sealing



Chesterton® R22KN Rod Seal are single-acting, continuous U-Cup designs. The special lip design provides an optimal amount of radial sealing load with excellent tribological and sealing characteristics, thus resulting in minimal frictional resistance and low heat generation. Utilization of R22KN U-Cup assists in reducing breakaway force and dynamic frictional force during operation.

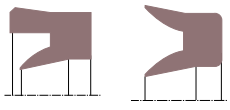
The optimum seal design facilitates controlled pressure distribution through the entire seal component. At the same time, the proper expansion space provides free space for deformation under pressure, optimizing the seal contact area on the sliding surface.

The positive rake lip profile wipes contaminants away from the mating surface while in operation, thus prolonging seal and equipment service life. This seal design is a rod seal that performs well in light-to-heavy-duty hydraulic and pneumatic applications.

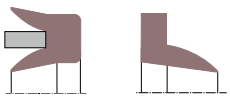
The 22KN design is manufactured using a machining process which allows the flexibility to create customised size based on equipment dimensions. Several unique designs have been derived from the original R22KN to address specific needs and applications in the market. These include designs for pressure reversal, pressure spikes, and system vacuuming.

- Replaceable wear rings; cost-effective method for improving equipment performance
- Reduce radial movement; reduce probability of metal-to-metal contact while extending seal life
- Custom Wear Rings eliminate unnecessary modifications
- Reduce probability the buildup of hydrodynamic pressure, thus prolonging seal life
- Machining process allows the flexibility to create customised size

PRODUCT PROFILES



R22KN5 **R22KN**



R22KN1 **R22KNH**

22KN5 incorporates a taller static lip for added stability and resistance against vacuuming and a flexible sealing lip for smooth, low-friction movement. It excels in low to medium-duty applications.

SPECIFICATIONS

Material (designation)	Size Range* mm (inch)	Temperature °C (°F)	Pressure MPa (psi)
AWC704 (FKM)	6 – 304.8 (1/4 – 12)	-30 – 200 (-20 – 400)	16 (2320)
AWC743 (FKM)	6 – 304.8 (1/4 – 12)	-20 – 150 (-4 – 300)	16 (2320)
AWC800 (EU)	6 – 2540 (1/4 – 100)	-50 – 85 (-60 – 185)	103.5 (15000)
AWC808 (AU)	6 – 400 (1/4 – 15.75)	-20 – 85 (-4 – 185)	40 (5800)
AWC825 (EU)	6 – 2540 (1/4 – 100)	-40 – 85 (-40 – 185)	52 (7500)
AWC860 (EU)	6 – 508.0 (1/4 – 20)	-50 – 120 (-60 – 250)	103.5 (15000)

**Please contact your Chesterton Customseal representative for larger sizes.*

9K Anti-extrusion Rings

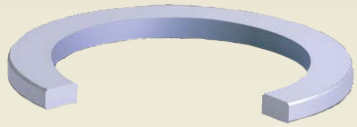
Prevent Extrusion of Dynamic and Static Seals

Chesterton® 9K Anti-extrusion Rings, often referred to as back-up rings, have no intended sealing function. 9K rings provides protection to pressurized dynamic and static seals (including O-Rings) from extruding into equipment clearances while under pressure thus protecting seal components from premature failure and prolonging their service life. Protection is provided by tight fit of the anti-extrusion rings in the seal groove to minimize the extrusion gap. In addition, 9K rings provides support to seals, which improves the seal's high-pressure handling capability and can assist seals in compensating for large temperature fluctuations.

9K rings are installed in the seal cavity together with either the elastomer or polyurethane sealing element located on the backside or low-pressure side of the sealing element they are supporting. In case of double-acting seals, anti-extrusion rings are located on both sides of the seal.

9K anti-extrusion rings are available in various extrusion-resistant materials (high durometer engineered plastics) and custom profiles. The most popular design is with a rectangular cross section however other profiles such as contoured and concave cross sections are available as well. Concave design provides larger contact areas to prevent excessive deformation of the O-Rings and to improve dimensional stability for the best performance. Split design options, for ease of installation, are available.

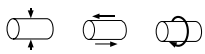
Each ring is individually manufactured and provides excellent performance, as a supporting element, to both piston, rod, and face seals that are generally found in static or dynamic applications.



- Provide protection against extrusion of sealing elements into equipment clearances; improve MTBR
- Improve high-pressure handling capability of the seals
- Static and dynamic applications; plant-wide usage
- Machining process allows the flexibility to create customised size
- Available in various profiles and materials

PRODUCT PROFILES

SPECIFICATIONS



Material (designation)	Size Range* mm (inch)	Temperature °C (°F)
AWC650 (Acetal)	6 – 381 (1/4 – 15)	-30 – 90 (-20 – 200)
AWC663 (Nylon)	6 – 600 (1/4 – 23.62)	-40 – 105 (-40 – 212)
AWC665 (Nylon with MoS_2)	6 – 1320 (1/4 – 52)	-40 – 105 (-40 – 212)
AWC800 (EU)	6 – 1320 (1/4 – 52)	-50 – 85 (-60 – 185)
AWC808 (AU)	6 – 400 (1/4 – 15.75)	-20 – 85 (-4 – 185)
AWC860 (EU)	6 – 508.0 (1/4 – 20)	-50 – 120 (-60 – 250)
AWC300 (Glass-Filled PTFE)	6 – 600 (1/4 – 23.62)	-35 – 120 (-30 – 250)
AWC400 (Carbon-Filled PTFE)	6 – 600 (1/4 – 23.62)	-35 – 120 (-30 – 250)
AWC500 (Bronze-Filled PTFE)	6 – 600 (1/4 – 23.62)	-35 – 120 (-30 – 250)
AWC520 (Virgin PTFE)	6 – 600 (1/4 – 23.62)	-35 – 120 (-30 – 250)
AWC630 (Unfilled PEEK)	6 – 152 (1 – 6)	-45 – 175 (-50 – 350)
AWC635 (Glass-Filled PEEK)	6 – 152 (1 – 6)	-45 – 175 (-50 – 350)

**Please contact your Chesterton Customseal representative for larger sizes.*

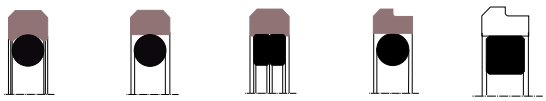
PCCS Piston Seals

Dual-component Cap Seals for Hydraulic and Pneumatic Sealing

Chesterton® Piston Custom Cap Seals (PCCS) are custom-manufactured, dual-component seals for piston application. This cap seal design is comprised of a two-piece, sealing system that uses a rubber energizer and high performance plastic cap, creating very effective sealing and providing long service life.
PCCS meets demanding operating conditions, where high sliding speed, elevated operating temperature, or hydraulic media compatibility challenges the seals or low friction is required. PCCS is an ideal sealing solution for a broad range of hydraulic and pneumatic applications.
The cap is used as the dynamic sealing element while the rubber energizer activates the cap and creates a static seal. The rubber energizer provides flexibility and support cap rings compensate for possible radial movements. The cap ring is preloaded with adequate contact surface to retain hydraulic media at zero or low pressure. Higher system pressure actuates the rubber energizer which compresses the cap ring more against the cylinder bore which increases sealing surface and sealing efficiency.
Special plastic compounds of the cap rings have low frictional characteristics. The most common materials are second-generation PTFE compounds and high performance thermoset polyurethanes. Such materials provide low breakaway and frictional force, so reducing the risk of stick-slip effect.
Each cap seal is made from our machining process which eliminates the need for tooling costs associated with new sizes. PCCS designs include single- and double- acting, single cavity versions.
Additional designs were developed for specific application and equipment needs. Both components are available in a range of engineered materials to best suit the specific operating requirements.

- Second-generation PTFE compounds and high performance polyurethanes offer improved performance
- Compression seal design increases sealing force with system pressure
- Proven seal design provides predictable performance
- Low breakaway and frictional force for smooth movement; reducing risk of stick-slip
- High performance solutions for the most demanding hydraulic and pneumatic applications

PRODUCT PROFILES



PCCS PCCS1 PCCS2 PCCS3 PCCS4

SPECIFICATIONS

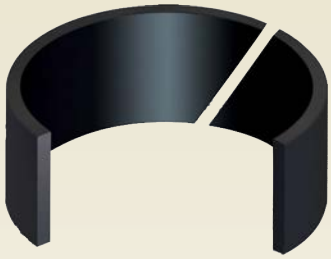
Material (designation)	Size Range* mm (inch)	Temperature °C (°F)	Speed m/s(ft/min) Reciprocating
AWC800 (EU)	6 – 1320 (1/4 – 52)	-50 – 85 (-60 – 185)	1(200)
AWC808 (AU)	6 – 400 (1/4 – 15.75)	-20 – 85 (-4 – 185)	0.5(100)
AWC830 (EU)	6 – 254 (1/4 – 10)	-35 – 75 (-30 – 175)	0.9(185)
AWC860 (EU)	6 – 508.0 (1/4 – 20)	-50 – 120 (-60 – 250)	1.25(250)
AWC300 (Glass-Filled PTFE)	up to 600 (24)	-35 – 120 (-30 – 250)	15(3000)
AWC400 (Carbon-Filled PTFE)	up to 600 (24)	-35 – 120 (-30 – 250)	15(3000)
AWC500 (Bronze-Filled PTFE)	up to 600 (24)	-35 – 120 (-30 – 250)	15(3000)
AWC520 (Virgin PTFE)	up to 600 (24)	-35 – 120 (-30 – 250)	15(3000)

**Please contact your Chesterton Customseal representative for larger sizes.*

WR Custom Wear Rings

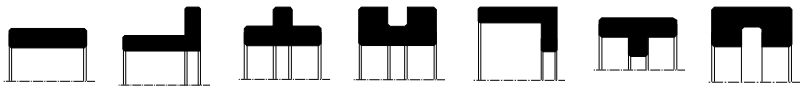
Custom Replacement Bearing Bands

Chesterton® Custom Wear Rings (WR) offer a cost-effective solution to cylinder remachining and repairs for hydraulic and pneumatic equipment. These split replaceable rings prevent metal-to-metal contact, extending equipment life and reducing recurring damage risk during cylinder repairs. Crafted from engineered plastics, they provide optimal bearing solutions for diverse operating conditions. These nonmetallic rings reduce radial movement, extend seal life, prevent hydrodynamic pressure buildup, and eliminate tooling costs. Our precision CNC lathe manufacturing offers accurate dimensions, improved fitting, and versatility for various designs and materials like WR, P9KL, R9KL, WRTP, WRTR, WRUP, and WRUR, catering to specific needs and applications.



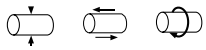
- Replaceable wear rings; cost- effective method for improving equipment performance
- Reduce radial movement; reduce probability of metal-to-metal contact while extending seal life
- Custom Wear Rings eliminate unnecessary modifications
- Reduce probability the buildup of hydrodynamic pressure, thus prolonging seal life
- Machining process allows the flexibility to create customised size

PRODUCT PROFILES



WR R9KL WRTR WRUR P9KL WRTP WRUP

SPECIFICATIONS



Material (designation)	Size range* mm (inch)	Temperature ˚C (˚F)	Compressive Strength MPa (psi) ASTM/ISO Testing	Permissible Compressive Load MPa (psi)	Speed m/sec (ft/min)
AWC650 (Acetal)	6 – 381 (1/4 – 24)	-30 – 90 (-20 – 200)	55.2 (8000)	20 (2900)	3 (600)
AWC663 (Nylon)	6 – 600 (1/4 – 23.62)	-40 – 105 (-40 – 212)	90 (13050)	30 (4500)	3 (600)
AWC665 (Nylon with MoS_2)	6 – 1320 (1/4 – 52)	-40 – 105 (-40 – 212)	96.7 (14000)	30 (4500)	3 (600)
AWC300 (Glass-Filled PTFE)	6 – 600 (24)	-35 – 120 (-30 – 250)	10.6 (1540)	3.5 (510)	5 (1000)
AWC400 (Carbon-Filled PTFE)	6 – 600 (24)	-35 – 120 (-30 – 250)	8.5 (1230)	2.5 (365)	5 (1000)
AWC500 (Bronze-Filled PTFE)	6 – 600 (24)	-35 – 120 (-30 – 250)	10.1 (1540)	4.5 (652)	5 (1000)
AWC520 (Virgin PTFE)	6 – 600 (24)	-35 – 120 (-30 – 250)	7.9 (1145)	2.5 (365)	5 (1000)
AWC630 (Unfilled PEEK)	6 – 152 (1 – 6)	-45 – 175 (-50 – 350)	138.1 (20000)	–1	(200)
AWC635 (Glass-Filled PEEK)	6 – 152 (1 – 6)	-45 – 175 (-50 – 350)	179.5 (26000)	–1	(200)

**Please contact your Chesterton Customseal representative for larger sizes.*

500 Series

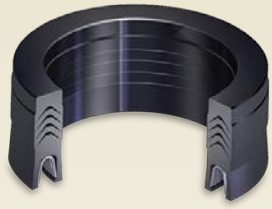
Stacked V-Ring Seals

High Performance, Multi-Purpose V-Ring Sets

High-performance, multi-purpose stacked V-Ring sets are ideal for demanding applications where reliability and seal performance are requirements; further, they accommodate hardware with deep stuffing boxes. These stacked sets are used in rotary and reciprocating applications and are available in solid and split designs, depending on application requirements.

A typical 500 Series V-Ring set comprises female and male gland adapters (for supporting and energizing functions) and three to five sealing rings, depending on operating conditions and equipment hardware configuration. The gland pressure (energizing axial force) is transferred between the seal rings, pressuring and creating optimal, positive contact with the counter surfaces.

Other 500 Series sets incorporate gland adapter rings, several seal rings (V-Rings) and radial Spring Energised Seal Rings. The radial SES ring is the primary sealing element. When it is pressurized by the system pressure, it activates the V-Rings by pushing against the gland adapter ring. The multiple seal edges reduce the risk of a potential leak path. The gland adapter ring supports the entire seal set and protects against extrusion. The 500 Series is available in several unique materials to address a broad range of applications, where chemical compatibility with media, high or low operating temperature, or high speed (fast reciprocating movements) make the application challenging to the seals.



- Unidirectional design, which replace V-Ring sets
- Multi-purpose V-Ring seal sets; plant-wide usage
- All seals are made-to-order; no equipment modifications required
- Custom profiles available
- V-Ring sets accommodate hardware with deep stuffing boxes

PRODUCT PROFILES

EPS500 EPS520 EPS521 EPS540

SPECIFICATIONS

Material (designation)	Size Range* mm (inch)	Temperature °C (°F)
AWC400 (PTFE) Carbon and Graphite	1.2 – 2032 (0.050 – 80)	-156 – 204 (-250 – 400)
AWC630 PEEK	1.2 – 254 (0.050 – 10)	-73 – 204 (-100 – 400)
AWC610 UHMWPE	1.2 – 2032+ (0.050 – 80+)	-253 – 82 (-425 – 180)

**Please contact your Chesterton Customseal representative for larger sizes.*

More than a Seal

Training

The Know-How Advantage

Continual personnel development is one way of attracting and retaining a capable workforce, and it is an area that receives a great deal of attention from Chesterton Customseal.

We regard training as a value-adding product that delivers both short- and long-term benefits. Appropriate training ensures the correct use of equipment, delivering longer life for the lowest overall cost of ownership and a rapid return on your training investment. Contact us to learn about our latest training schedule.

Chesterton® Legacy

Wide Range of Product Portfolio

View the full line of Chesterton® Polymer Seals including hydraulic and pneumatic seals, rotary seals, and spring-energised seals visiting **chesterton.com** or contacting us to request our new polymer seals catalogue.

Chesterton ISO certificates available on

chesterton.com/corporate/iso

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Where to from here?

Contact your local Sales Representative to discuss your specific needs.

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CHESTERTON
CUSTOMSEAL

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