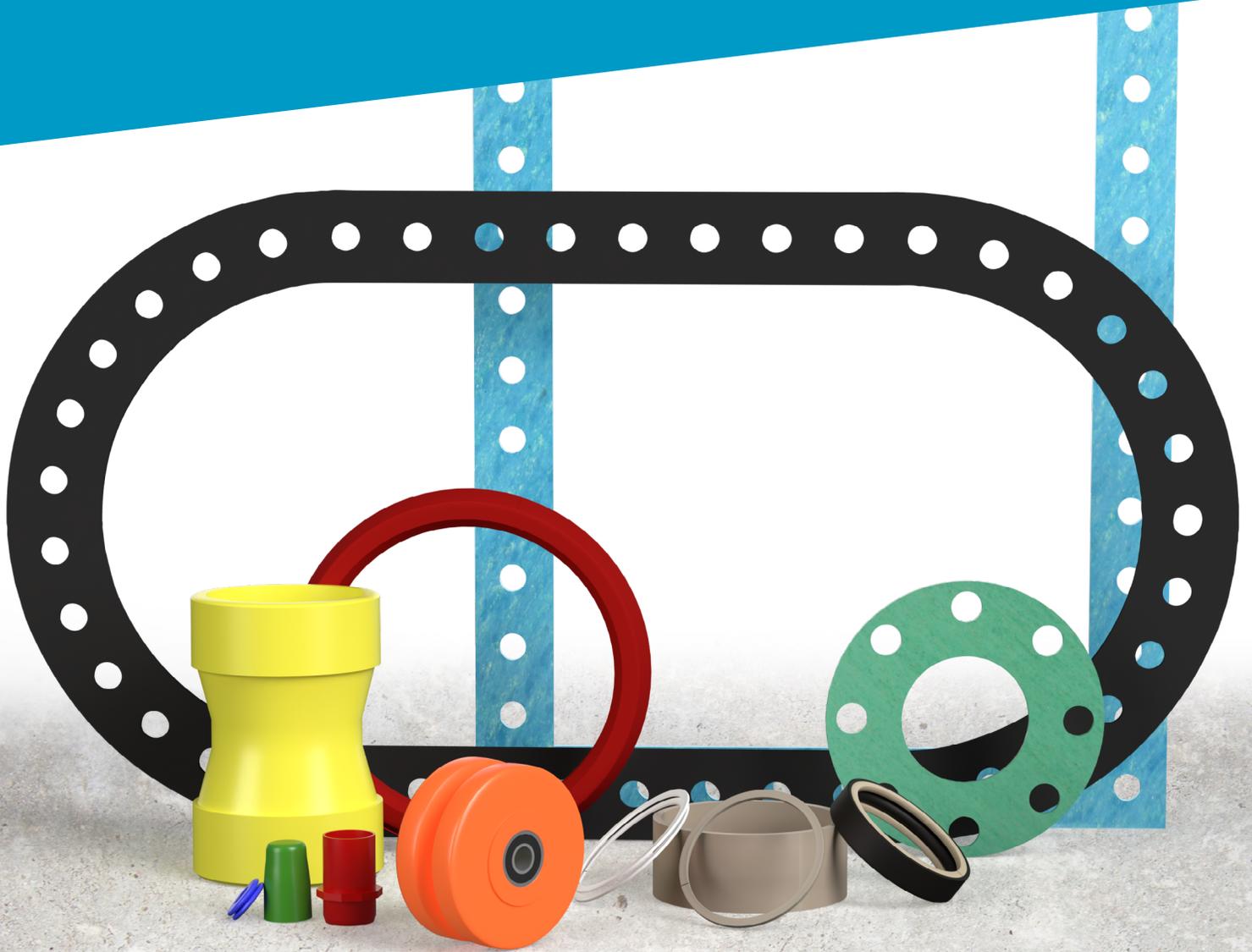




Hi-Tech Seals



Manufacturing

Rapid Seal • Rapid Gasket • Cast Urethane



Our Vision

Provide superior value to our customers.



Our Mission

Supply quality products delivered on time, at a competitive cost, backed by a knowledgeable team of sealing professionals, so our customers may grow and prosper.

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Introduction

For over 33 years Hi-Tech Seals has been recognized as a leader in the distribution and manufacturing of industrial seals, gaskets, and rubber and plastic solutions. We continually invest in new and innovative products, materials, and services with the intention of helping our customers grow and prosper in an ever-changing world economy.

We offer a personal solution to the business world, tailoring our business relationship to reflect the needs of our clients. We work alongside a variety of industries, while maintaining a high standard for all our products and services. Our diverse supply chain allows our customers to be confident we will provide a solution that meets and exceeds their specifications.

Kit Creation Program

Whether needed for maintenance or manufacturing, our kits are an excellent system to help our customers stay organized, increase efficiency, and simplify the ordering process. Our knowledgeable team of seal professionals can assist with identifying the components and create your kit in our system. The kit labels can include company name, logos, part numbers, application information, and other applicable information. When placing an order, simply provide us with one part number and receive all components in one package.

ISO 9001 Registered QMS

At Hi-Tech Seals, we are committed to our Quality Management System (QMS). Our first branch registered under an ISO QMS in 1996. We are proud to state that our entire company is registered under the ISO 9001:2015 Quality Management System. The three main goals of our policy include:

- Hi-Tech Seals shall distribute and/or manufacture a quality product that will meet our customers' expectations and applicable requirements.
- Hi-Tech Seals shall commit to quality objectives agreed upon by senior management, identified through a holistic and collaborative approach involving all potential stakeholders.
- Hi-Tech Seals shall strive to continually improve the Quality Management System (QMS) effectiveness based on efficient processes, well-defined measurements, and best practices.

After Hours Service

If you experience a seal or gasket emergency our technical professionals are available 24 hours a day. Hi-Tech Seals offers after-hours service seven days a week to ensure our customers' businesses can continue operating. To assist our customers to the best of our ability we also offer after hours Rapid Seal machining and Rapid Gasket manufacturing services. *Charges may apply, provided we can assist you.*



Rapid Seal

Rapid Seal is our in-house elastomer and plastic machining services. Our team of sealing professionals can quickly design and manufacture new, replacement, and prototype components that meet our customers' needs. Customers can select from standard pre-programmed profiles or collaborate with our professionals to design a custom component. Machined parts can save companies time, money, and the inconvenience of searching for difficult-to-find parts.

Rapid Seal advantages:

- Quick turnaround times
- No minimum quantities
- Extensive stock of elastomer & plastic billet and tube stock
- Over 130 pre-programmed profiles
- Custom designed solutions to customer specifications
- Access to engineering & drafting services
- Strict quality control and inspection procedures

Rapid Prototyping

During the development stage of new components, typically multiple design revisions are required. Rapid Seal allows us to quickly machine prototype parts for our customers, without the costly tooling associated with moulded prototypes.



For lower durometer parts, we carry billet and tube stock of select materials as soft as 70 Shore A durometer. The softer material enables our customers to receive a prototype that more closely simulates that final product. While working with us, customers gain access to our experienced engineering, drafting, and machining professionals for additional design support.

Capabilities

Our Rapid Seal division employs a diverse range of cutting-edge machining equipment. This equipment is capable of machining standard and custom profiles with an ID as small as ¼" (6 mm) to an OD as large as 29" (737 mm).

In-house, we can maintain tight precision on elastomeric and thermoplastic machined components. Our machined elastomers are available in 70 to 95 Shore A durometer. Our tolerance capabilities vary depending on the parts' dimensions.

Materials

We stock an extensive range of elastomeric compounds and plastic materials. This allows us to provide superior machined solutions that optimize our customers' applications. Our materials are available in a range of tube and billet sizes, enabling us to

reduce material waste and save our customers' money. Our machined elastomers are available in 70 to 95 durometers on the Shore A scale.

Plastics

- KasPex™ PEEK
 - Virgin
 - Carbon reinforced
 - Glass reinforced
- Nylon
- Acetal
- UHMW-PE
- Ekonol®
- Torlon®/Polyamide-imide
- Vespel®
- Ertalyte®/PET-P
- Polyphenylene Sulphide (PPS)
- PTFE
 - Virgin
 - Bronze reinforced
 - Carbon reinforced
 - Carbon/Graphite reinforced
 - Glass reinforced
 - Moly/Glass reinforced

Elastomers

- Nitrile
- Hydrogenated Nitrile
- BoKure™ Urethane
- BoKure™ GHOST
- Viton™/Fluorocarbon
- Ethylene Propylene (EPDM)
- Aflas® FEPM
- Neoprene/Chloroprene
- Hytrel®



Profiles

Customers have access to our library of over 160 pre-programmed Rapid Seal profiles. Our technical professionals can work with customers to modify standard profile designs to optimize seal performance. Possible design modifications include lip design, seal clearances, and various other key dimensions.

The material legends on the following pages represent the standard material used for a specific profile. For more information and a complete listing of available materials, reach out to a Hi-Tech Seals professional.

Guide Rings

- Rubber
- Urethane
- PTFE
- Commonly a plastic (Nylon/PEEK)



DF101



DF102



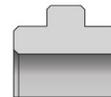
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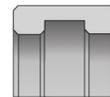
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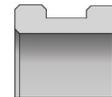
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DF106



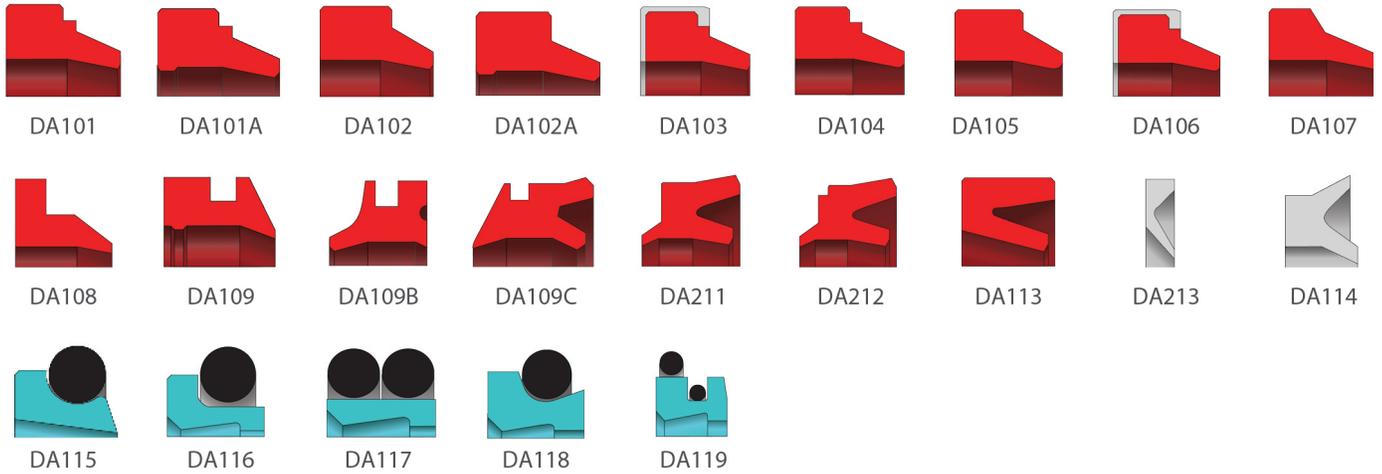
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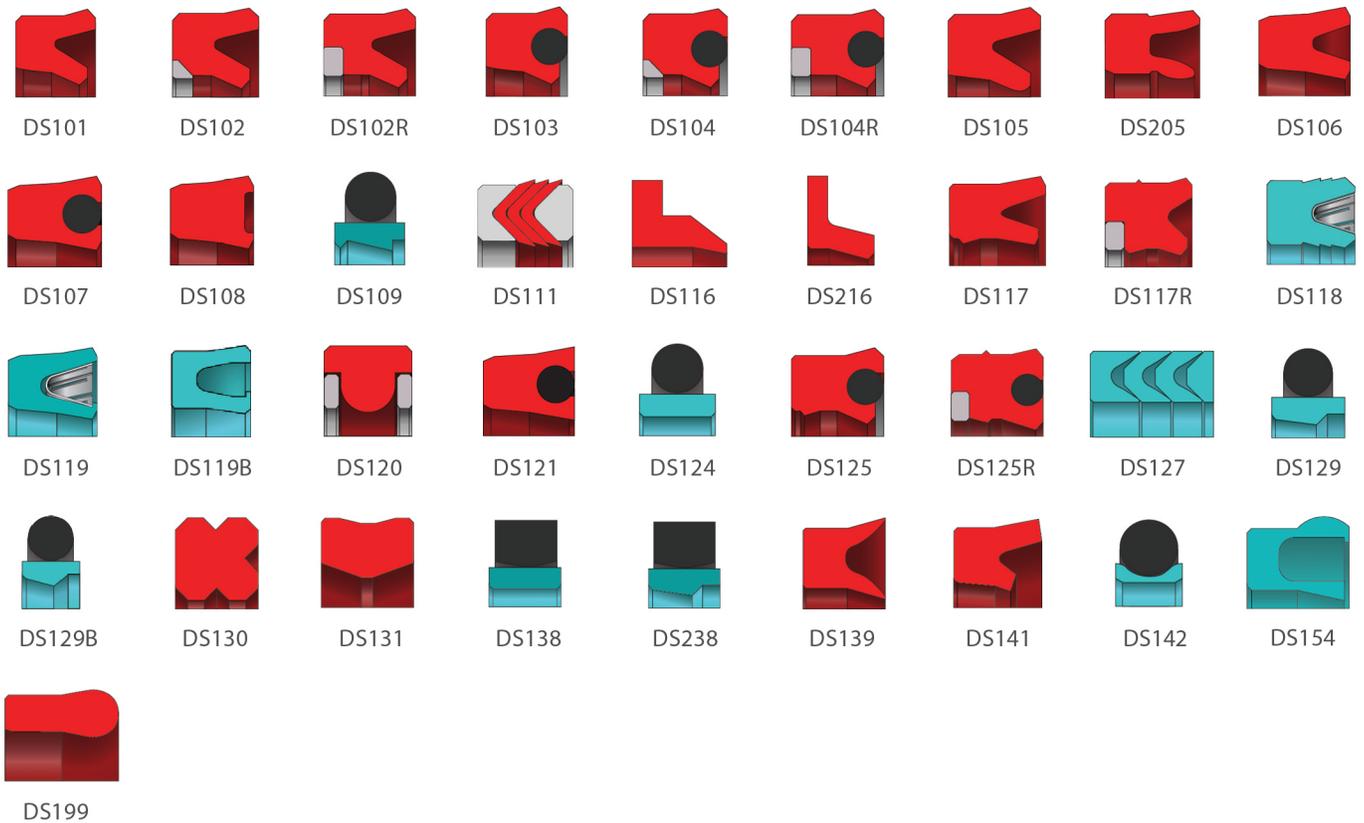
DF108

Wipers

● Rubber ● Urethane ● PTFE ● Commonly a plastic (Nylon/PEEK)



Rod Seals



Piston Seals

● Rubber ● Urethane ● PTFE ● Commonly a plastic (Nylon/PEEK)



Rotary Shaft Seals

● Rubber ● Urethane ● PTFE ● Commonly a plastic (Nylon/PEEK)



DR101



DR101F



DR102



DR103



DR104



DR105



DR106



DR107



DR108



DR109



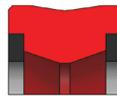
DR110



DR111



DR112



DR113



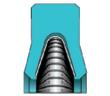
DR115



DR116



DR117



DR118



DR119



DR121



DR201



DR202



DR203



DR204



DR205



DR206



DR207

Back-Up Rings



DST108



DST109



DST110



DST111



DST112



DST113

Gaskets



DFL101



DFL102



DFL103



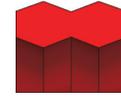
DFL104



DFL105



DFL106



DFL108



DFL109



DFL110



DFL111



DFL112

Materials

We stock a large inventory of rubber, plastic, and composite sheet materials, which allows for quick turnaround time of cut gaskets. Our inventory is available for fabrication and direct sale. Materials are available for purchase by the roll or per square foot.

Don't know which material best suits your application requirements? Our knowledgeable team of gasket professionals can assist in determining the material that best meets the demands of your application.



Composite Non-Asbestos

BA-U
BA-50
BA-CF

Thickness: 1/64", 1/32", 1/16", 1/8"
Sheet Size: 5' x 5', 5' x 10', 5' x 15'

Composite Flexible Graphite

Graflit® SF
Graflit® SL
Graflit® SP

Thickness: 1/64", 1/32", 1/16", 1/8"
Sheet Size: 3' x 3'

Rubber and Plastic

RyFlor™ RF40
Nitrile
Hydrogenated Nitrile
White Nitrile
Nitrile Sponge
Cork/Nitrile
Viton™/Fluorocarbon
PTFE
Ethylene Propylene (EPDM)

Thickness: 1/64", 1/32", 1/16", 1/8", 3/16", 1/4"
Sheet Size: 4' x 25', 4' x 50', 4' x 100'

Chloroprene/Neoprene
Silicone
Silicone Sponge w/PSA Backing
UHMW-PE
Neo-Nylon
Red Rubber
Vegetable Fibre/Plant Fibre
Natural Rubber





Equipment

Flashcutter

Our Atom Flashcutters use CAD renderings to quickly manufacture gaskets from rubber, plastic, and composite materials. Our flashcutters' surface area can accommodate sheet material up to 60" x 120". There is no limit on the size of gaskets we can manufacture. For gaskets that exceed the bed size, we can use a dovetail or skiving technique.

Flashcutters use a rapid vertical reciprocating movement to cut through sheet material. This allows us to produce cleaner finished gaskets without compression marks that can appear when other manufacturing methods are used. We are able to maintain exceptional tolerances on our gaskets.

LaserQC®

We employ a Virtek LaserQC® 1200 machine. This piece of equipment assists in reverse engineering, quality inspection and control, and statistical process control. It captures over 500 data points per second, while maintaining a tolerance within $\pm 0.05\text{mm}$ (0.002"). Our drafting technicians adjust scanned data to optimize the tolerance levels. The file can then be exported directly to our flashcutters for rapid gasket production.

BoKure™ Urethane



We manufacture cast urethane products for applications across countless industries. Our knowledgeable team of urethane professionals can assist with the design, development, and manufacturing of simple or complex components.

Our BoKure™ urethane compounds offer excellent characteristics that help save customers money by increasing product longevity, equipment run time, and reducing costly maintenance. These compounds are commonly used as alternative replacements for rubber, plastic, or metal components. They are also beneficial where impact, corrosion, and wear is a concern. We are capable of manufacturing standard or custom components such as rollers, spacers, protector products, and bushing impact pads. If required, we can reverse engineer components with low tooling costs.

Design & Development

We aid in the design and development of cast urethane solutions. Our urethane professionals gather vital information about the component, its intended use, and the application's environ-

ment. Using this information, they determine what, if any, enhancement can be made to the initial design. From here our drafting technicians generate detailed computerized 3D models of the component, which is then 3D printed to create the mould cavity. This process gives us complete control of mould development and reduces expensive tooling costs for our customers. For components that exceed our 3D printing capabilities, our machining facility can create tools in-house.



Customizing Your Urethane Solution

BoKure™ urethane compounds are made using high performance resins, curatives, and additives, with each possessing its own set of unique capabilities and advantages. We can assist with selecting the ideal compound for your application and environmental demands. When creating a BoKure™ urethane product there are two main types of urethanes, polyether and polyester.



Polyester advantages:

- Oil and fuel resistance
- High-shock absorption
- Great dynamic properties
- Increased resistance to heat aging

Polyether advantages:

- More flexibility over polyesters
- Remarkable hydrolysis resistance
- Good moisture resistance
- Excellent low-temperature performance

Durometers

Cast urethane components can span a broad range of hardness, from as soft as an eraser to as hard as a bowling ball. Hi-Tech Seals can maintain urethane's toughness and resilience while manufacturing components for Shore A and Shore D durometers. Our in-house capabilities allow us to manufacture dual durometer urethane components.

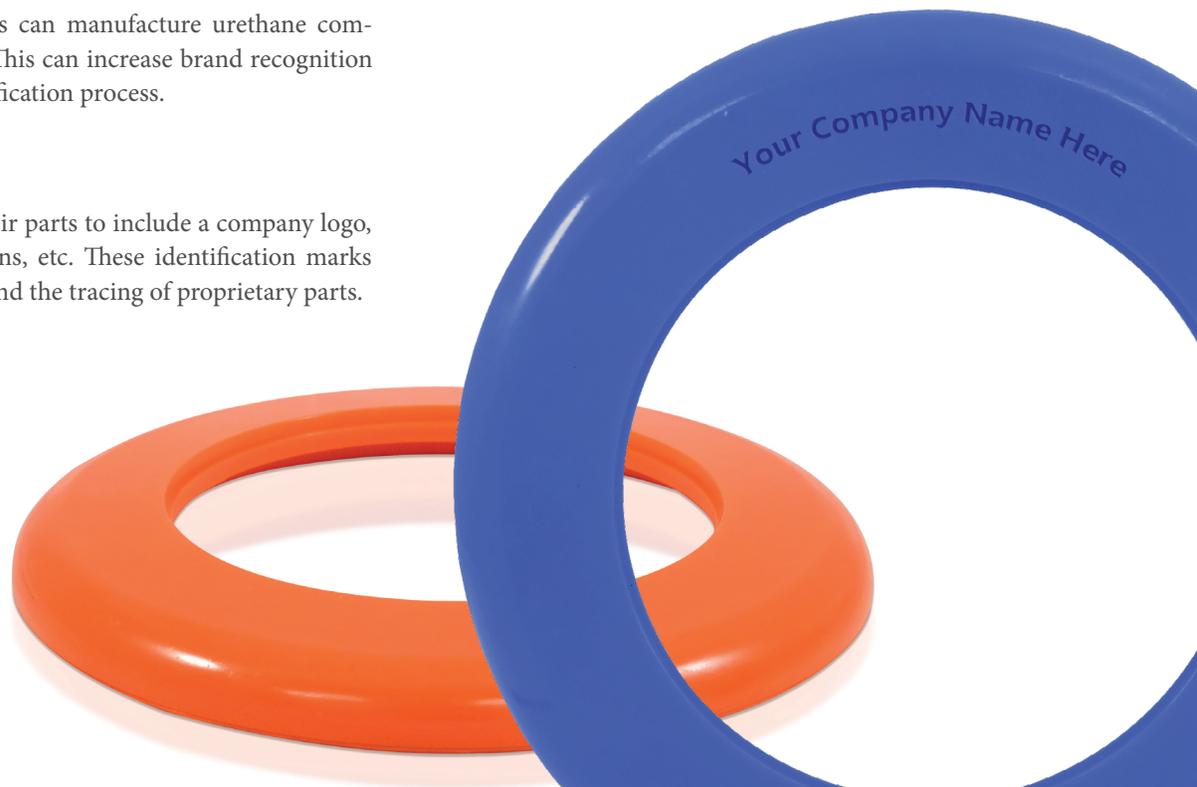
Shore A	30	35	40	45	50	55	60	65	70	75	80	85	90	95			
Shore D														65	70	75	87

Custom Colours

Upon request, Hi-Tech Seals can manufacture urethane components in custom colours. This can increase brand recognition and help with the part identification process.

Logo & Part Numbers

Our customers can tailor their parts to include a company logo, part number, part dimensions, etc. These identification marks aid with brand recognition and the tracing of proprietary parts.





We have collaborated with customers from design to production of superior moulded components for over 33 years. With our experience and extensive range of capabilities, we can provide high performance parts for our customers' unique applications. We are able to bond our rubber materials to metal and PTFE.

Rubber to Metal Bonded Parts

We offer elastomer to metal bonded solutions that meet and exceed our customers' requirements. Our professionals assist with the design and material selection for your components. Our end goal is to provide a solution that extends product run time and reduces maintenance costs.

Rubber to PTFE Bonded Products

PTFE is known for being a non-stick material, with excellent chemical resistance and low friction capabilities. This makes it difficult to bond it to other elastomers and materials. We have embraced the challenge and implemented a tried-and-true method that creates a durable and long-lasting bond between the materials. We can bond a range of elastomers including nitrile, hydrogenated nitrile, EPDM, fluorocarbon, and silicone, to both virgin and reinforced PTFE.

Other rubber moulding capabilities we offer include reinforcing rubber materials with fabric and incorporating metal inserts into components.

We offer a vast selection of high-performance rubber materials that meet customers' application requirements. Common rubber moulding materials include:

- Nitrile
- Hydrogenated Nitrile
- Viton™/Fluorocarbon
- Ethylene Propylene (EPDM)
- Aflas® FEPM
- Silicone
- Perfluoroelastomer
- Fluorosilicone

Spliced & Vulcanized O-Rings

We offer spliced and vulcanized O-rings in standard and square profiles, multiple cross sections, and in various materials. Quad ring cord is available upon request.

Spliced and vulcanized O-rings are made by cutting extruded cord stock into lengths, then joining them together. The ends are bonded together by applying a head activated bonding agent and placing them in a high temperature die for a specific time frame. This process forms a molecular connection needed to create a strong bond.

These O-rings are an excellent choice for static sealing applications when:

- A moulded O-ring can't be used due to size requirement or non-standard dimensions
- A small quantity of O-rings is needed
- The lead time for moulded O-rings is too long

Vulcanized O-rings are an excellent replacement for any unique sized static O-ring, withstanding up to a maximum of 1200 psi.

When vulcanizing O-rings, the minimum inner diameter that can be vulcanized varies depending on the cross section. Please refer to the table below as a guideline of minimum diameters for popular cross section sizes.

C/S	Min. ID
0.139	4.000
0.210	4.500
0.275	4.500
0.375	5.500



Our cord stock is available in cut lengths, splicing kits, and through our in-house splice and vulcanizing service. Materials include, but are not limited to:

- Nitrile
- Hydrogenated Nitrile
- Viton/Fluorocarbon
- Alfas® FEPM
- EPDM
- Neoprene/Chloroprene
- Silicone

O-ring Cord Cross Sections

Imperial (inches)									
0.063	0.094	0.103	0.125	0.139	0.188	0.210	0.250	0.275	0.312
0.375	0.437	0.500	0.562	0.625					

Metric (mm)									
1.60	2.00	2.40	2.50	3.00	3.50	4.00	4.50	5.00	5.70
6.00	6.50	7.00	8.00	9.00	10.00	11.00	12.00		

Additional sizes are available upon request.

Square Cord Cross Sections

Imperial (inches) Square Cord									
0.103	0.125	0.139	0.210	0.250	0.275	0.312	0.375	0.500	

Additional sizes are available upon request.

Kit Creation Program

Our kit creation program offers customers a simplified system to order and reorder various seals and related products for maintenance or manufacturing.

We understand that our customers' kitting requirements range in complexity from basic to highly intricate. We offer three service levels that meet these varying demands. Our team of sealing professionals work closely with our customers to determine which service level best suits their needs. They can also assist customers with identifying and measuring kit components.

Once identified, the components are grouped into a single part number for fast and easy ordering and reordering. As required, customers can include additional instructions within their kits.

Kit creation program advantages:

- Increased inventory control
- Streamlined processes
- Consolidation of inventory & increased picking and assembly efficiencies
- Brand recognition



Engineering Seal Analysis Lab & Drafting Services

Our in-house Engineering Seal Analysis Lab has become a vital component in our commitment to quality and providing superior value to our customers. It employs cutting-edge equipment that allows our technical staff to perform a variety of critical testing and analyses of elastomers, thermoplastics, and metals.

Our lab helps ensure we deliver the right product, in the right material, within the required specifications to our customers. Furthermore, it saves time and money by reducing the need to send product samples to third-party testing labs.

Some of the key tests, analysis, and services our engineer and drafting technicians use the equipment and lab for include:

- Failure Analysis Reports (FAR)
- Positive Material Identification (PMI)
- Dimensional Inspection Report
- Comparative Material Analysis

While working with us, customers gain access to our drafting services for additional support. Our drafting technicians provide customers with precision drawing solutions.



Mid-Infrared FT-IR Spectrometer



XRF Gun

Laser Engraving

More and more companies are looking to have specific information or identifying marks on their parts. These marks help with product identification, traceability, branding, and simplifies the re-ordering process.

Our laser engraving machine allows customers to engrave their company name, part number, application information, logo, and other important identifiers onto parts. It is can engrave most plastic, rubber, and metal materials. The focused laser beam etches damage-free and easy-to-read marks along a surface as small as 1/8" tall.

Laser engraving advantages:

- Improve the reordering process for staff and customers
- Assists with product traceability
- Capable of engraving on flat and round surfaces without distorting the text or image
- Increases brand exposure
- Locks in proprietary part ordering



Custom Labels

The bags and labels products come in typically have important information on them. At Hi-Tech Seals, we can customize labels to include a company name, logo, part number, material, and other relevant information. This can save customers time and money from re-labelling products once received.

Custom labels can help staff and customers reduce installation and inventory errors with key information at their fingertips. They are also beneficial when the product needs to be reordered.

Custom label advantages:

- Increase brand exposure
- Company-specific part numbers
- Easier reordering process
- Labels can be specific to the application

Acetal (POM) (Delrin® - DuPont™)

-40°C to 100°C (-40°F to 212°F)

- Used for valve seats, wear rings, spacer rings and often used as a bearing material
- Hard thermoplastic material,
- Excellent wear resistance and low water absorption
- Easy to machine,
- Low coefficient of friction

Ethylene Propylene (EPDM)

-54°C to 150°C (-65°F to 302°F)

- Excellent resistance to ozone, hot water, steam, and aging
- Commonly used with brake fluids and refrigerants
- Poor resistance to petroleum fluids and mineral oils

Fluorocarbon (FKM, FPM) (Viton® - Chemours)

-26°C to 204°C (-15°F to 400°F)

- Excellent resistance to high temperatures, petroleum oils, and gasoline
- Wide chemical resistance range
- Great ozone, weather, and aging resistance
- Poor compatibility with H₂S over 2%, amines, acetone, hot water, and steam
- Poor low temperature characteristics
- Low temperature compounds are available with a minimum temperature of -40°C (-40°F)

Hydrogenated Nitrile (HNBR, HSN)

-40°C to 160°C (-40°F to 320°F)

- Nitrile based compound with improved chemical resistance and a wider temperature range
- High strength material that resists extrusion, abrasion, and wear
- Water and steam resistance to +149°C (+300°F)
- H₂S resistance up to 10%
- Commonly used with petroleum oils and CO₂
- Do not use with chlorinated hydrocarbons, polar solvents, or strong acids
- Low temperature compounds are available with a minimum temperature of -55°C (-67°F)

Nitrile (NBR)

-40°C to 120°C (-40°F to 248°F)

- Presently the most widely used elastomer in the seal industry
- Exceptional balance of good mechanical properties, wear properties, and chemical resistance
- Resistant to most mineral oils and greases
- Do not use with glycol-based brake fluids and strong acids
- Low temperature nitrile compound available down to -55°C (-67°F)

Polyetheretherketone (PEEK)

(Kaspex™ PEEK - Hi-Tech Seals)

-70°C to 260°C (-94°F to 500°F)

- Outstanding chemical resistance
- Excellent high temperature performance
- Exceptional wear and abrasion resistance
- High strength
- Maintains mechanical properties in high temperatures
- Commonly used for anti-extrusion purposes
- Do not use with hydrochloric, nitric, or sulphuric acids

Polyethylene (UHMW-PE)

(Tivar® - Mitsubishi Chemical Advanced Materials)

-250°C to 80°C (-418°F to 176°F)

- Commonly used as wear rings, valve seats, and in high-speed sealing applications
- Good impact and abrasion resistance
- Low coefficient of friction
- Non-sticking and self-lubricating material
- Excellent mechanical properties
- Found to provide superior performance compared to PTFE when used in water applications

Polyethylene Terephthalate (PET-P)

(Ertalylte® - Mitsubishi Chemical Advanced Materials)

-20°C to 100°C (-4°F to 212°F)

- Excellent dimension stability in wet and dry environments
- Exceptional wear, chemical, and abrasion resistance
- Low coefficient of friction
- High strength
- Resistance to moderately acidic solutions
- Available in different grades

Polyamide (PA) (Nylon - DuPont™)

-30°C to 93°C (-22°F to 200°F)

- Excellent abrasion and wear resistance
- Common applications are wear rings, bushings and anti-extrusion rings
- Possesses a high-water absorption rate that leads to swelling of the material
- Available in different grades including FDA compliant, internally lubricated, heat stabilized

Polyamide-imide (PAI) (Duratron®- Mitsubishi Chemical Advanced Materials) (Torlon®- Solvay)

-196°C to 260°C (-320°F to 500°F)

- Provides the overall highest performance capability of any melt processable thermoplastic
- Capable of performing under severe stress conditions at continuous temperatures up to 260°C (500°F)
- Low coefficient of thermal expansion & high creep resistance contributes to dimensional stability

Polyphenylene Sulphide (PPS)**(Techtron®- Mitsubishi Chemical Advanced Materials)**

Up to 220°C (Up to 428°F)

- Good chemical resistance
- High-temperature and high strength plastic
- Possesses a higher strength and is an economic alternative to PTFE, though its temperature and fluid resistance isn't as comprehensive
- High-temperature, structural plastic for automotive parts
- Fluid resistance can be limited by additional reinforcements, therefore it is important to assess individual grades for compatibility
- Used for back-up rings, V-ring material in oilfield applications, plastic pistons, valve bodies, and the housing of integral seals and gaskets

Polytetrafluoroethylene (PTFE)

-260°C to 260°C (-436°F to 500°F)

- Virtually universal chemical resistance
- Very low coefficient of friction

Reinforcements such as bronze, moly, glass, and carbon are commonly added to alter mechanical properties

Polyurethane (AU, EU) (BoKure™ Urethane - Hi-Tech Seals)

-54°C to 105°C (-65°F to 221°F)

- Thermoplastic elastomer with higher tensile strength, toughness, and wear resistance
- Great combination of hardness and elasticity
- Excellent low temperature flexibility
- Commonly used in high-pressure hydraulic systems where components are subject to wear

Tetrafluoroethylene-Propylene Copolymer (FEPM, TFE/P) (Aflas™ FEPM - Asahi Glass Co.)

-9°C to 232°C (+16°F to 450°F)

- Good high temperature capability
- Resistant to strong acids and bases, amines, solvents, and hot water
- Found in numerous oilfield applications
- Poor low temperature performance and low resilience

Thermoplastic Elastomer (TPC- ET) (Hytrel® - DuPont)

-54°C to 149°C (-65°F to 300°F)

- Thrives in high temperatures and hostile fluids
- Excellent strength and toughness properties
- High resilience and flexibility which permits easier installation than PTFE materials
- Not suitable with water or phosphate fluids above +80°C (+176°F)

* The material information provided is based on multiple industry accepted reference sources. It is intended to serve as a general guideline. Testing material in the application environment is highly recommended.

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