EPS Division FAQ

Engineered Polymer Systems ("EPS") Division
Frequently Asked Questions

<table>
<tr><th>General</th><th>Answer</th></tr>
<tr><td>How long can Parker seals be stored prior to installation</td><td>
In 1998, the Society of Automotive Engineers (SAE) issued an Aerospace Recommended Practice (ARP) for the storage of elastomer seals and seal assemblies prior to installation (ARP 5316). The shelf lives listed in ARP 5316 are limited to materials supplied to various AMS and US Military specifications. At Parker, we have expanded on that list. This has meant grouping compounds by polymer family and assigning that family a uniform shelf life. The shelf life of each polymer family as practiced by Parker EPS Division is shown in the table below
<table>
<tr><th>Polymer Family</th><th>Storage Life</th></tr>
<tr><td>SBR</td><td>3 Years</td></tr>
<tr><td>Polyurethane, PU, TPE, TPCE (Polymyte®)</td><td>10 Years</td></tr>
<tr><td>Nitrile, Neoprene, HNBR, Polyacrylate, Natural Rubber, CSM</td><td>15 Years</td></tr>
<tr><td>Ethylene Propylene, Fluorocarbon, Perfluorinated elastomer, Butyl, Silicone, Fluoro-silicone, Polytetrafluoroethylene (PTFE), Tetrafluoroethylene Propylene (Aflas®)</td><td>Unlimited</td></tr>
</table>
The values above assume the proper guidelines for storage conditions are followed. If plastic and rubber products are stored improperly, their physical properties may change.

Prior to use, all parts should be checked for hardness, surface cracking or peeling. If any of these conditions are observed, the parts should be discarded. Some compounds can exhibit a build-up of powderly film on their surface over time. This natural occurrence is referred to as bloom and does not in any way negatively impact the function of the seal.
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Contact Information:

Parker Hannifin Corporation
Engineered Polymer Systems Division
phone 800 233 3900
eps-ccare@parker.com
www.parker.com/eps

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General	Answer
What are the proper guidelines for Seal Storage and Handling?	**Records:** Records should be kept to ensure that stock is rotated such that the first seals in are the first out (FIFO). **Temperature:** Seals must be stored away from heat sources such as direct sunlight and heat generating fixtures/appliances. Maximum storage temperature if 100°F (38°C). Low temperatures do not typically cause permanent damage to seals, but can result in brittleness, making them susceptible to damage if not handled carefully. Ideally, seals should not be stored at temperatures less than 50°F (10°C) and should be warmed to room temperature before installation. **Ultra Violet:** Seals must be protected from direct sunlight and any artificial light that generates ultra violet radiation. **Humidity:** Case should be taken to ensure seals are always stored in an environment with a relative humidity of less than 65%. Polyurethane seals, in particular, are very susceptible to damage from exposure to moisture and should be stored in air-tight containers. **Oxygen and Ozone:** Ozone-generating equipment and oxygen exposure can be detrimental to seal compounds. Seals should be stored in air-tight containers. Any electrical equipment that generates a spark should not be used near seal storage. **Contamination:** Keeping seals free from contamination will assist in prolonging service life. Good housekeeping practices should be maintained. **Distortion:** Large seals should be stored flat when possible and not suspended, which may cause distortion over time. Do not store seals on hooks, nails, or pegboard.
What CAGE code should I reference with Parker seals?	Parker EPS Division has several government assigned CAGE codes depending on the location of manufacture. If you are unsure which of the following categories your seals fall within, please use the Contact Us link above to verify. 30781 Salt Lake City, UT – Molded Polyurethane and Rubber Linear Seals, Nylon Wear Rings 48482 Nacogdoches, TX – Molded Rubber Rotary and Linear Seals 0F5F7 Elgin, IL – Machined PTFE Products and PTFE Wear Rings
Why is the piston OD different between the PolyPak section of the Fluid Power Seal Design Guide (Catalog EPS5370) and the wear ring section of the catalog.	Adding a bearing to a piston adds an additional part to the assembly of the finished component. Now there are four dimensional tolerances that have to be accommodated (bore, piston OD, wear ring thickness, and wear ring groove diameter). In order to avoid metal-to-metal contact, this additive tolerance stack-up requires additional gap between the piston OD and the bore.

<table>
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<tr><td>What is stick-slip?</td><td>
Stick-slip is characterized by a distinct stop-start movement of the cylinder, and may be so rapid that it resembles severe vibration, high pitched noise or chatter.

Seals are often thought to be the source of the stick-slip, but other components or hardware can create this issue.

Causes of stick slip include:
• Swelling of wear rings or back-up rings
• Extreme side-loading
• Valve pulsation
• Poor fluid lubricity
• External sliding surfaces
• Seal pressure trapping
The following are tips for trouble-shooting and solving stick-slip

<table>
<tr><th>Possible Cause</th><th>Troubleshooting Tip</th></tr>
<tr><td>Surface finish out of specification</td><td>Verify surface is neither too smooth nor too rough</td></tr>
<tr><td>Poor fluid lubricity</td><td>Change fluid or use oil treatments or friction reducers</td></tr>
<tr><td>Binding wear rings</td><td>Check gland dimensions, check for thermal or chemical swell</td></tr>
<tr><td>Side loading</td><td>Review cylinder alignment, incorporate adequate bearing area</td></tr>
<tr><td>Seal friction</td><td>Use material with lower coefficient of friction</td></tr>
<tr><td>Cycle speed</td><td>Slow movement increases likelihood of stick-slip</td></tr>
<tr><td>Temperature</td><td>High temperature softens seals, expands wear rings, and can cause thermal ex-pansion differences within hardware</td></tr>
<tr><td>Valve pulsation</td><td>Ensure valves are properly sized and adjusted</td></tr>
<tr><td>External Hardware</td><td>Review system for harmonic resonance</td></tr>
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General	Answer
The Basis of the PolyPak® Seal Design	By definition the The PolyPak Seal design consists of a shell compound which is tough and durable and wear/extrusion resistant. Inside the PolyPak shell is an o-spring (o-ring) expander used to create a spring for the sealing lips of the PolyPak shell material. The o-spring is a softer hardness compound which provides the spring action to the sealing lips. Once the PolyPak is installed in application the o-spring is deformed but it wants to be round as before thus it pushes back against the sealing lips which creates a tight sealing function. We call this PolyPak a squeeze seal because the sealing lips of the PolyPak and the o-spring energizer of the PolyPak are all squeezed once installed. This squeezed situation causes the PolyPak sealing lips to conform to the metal irregularities creating a dam to prevent fluid from migrating from one side of the PolyPak to the opposite side. This squeeze seal will then have high fiction, higher wear rates, but will have good sealability. This squeeze action of the PolyPak will cause increased friction to the system. There are some internally lubricated rubber compounds which can be used to eliminate a little of the friction but the eliminated friction amount is small as compared to the overall friction created by the PolyPak design. In some applications a small amount of seepage can be tolerated but friction becomes the major issue. Under a friction situation the o-spring can be removed from the PolyPak Seal. When the o-spring is removed the pocket for the o-spring can now be considered similar to the valley of typical U-Cup designs. The PolyPak will then act like a U-cup. The PolyPak will have lower friction, lower wear rates, but will give up sealability and will seep in application.

General	Answer
The o-ring inside a PolyPak seal looks like an o-ring. Is its function the same? Or different?	The o-spring inside a PolyPak Seal looks like an o-ring but in fact it performs the function of a spring to push the sealing lips of the PolyPak shell outward towards the sealing surfaces. The o-spring in no way performs the function of an o-ring seal. The o-spring is not a seal but is an auxiliary device which aids the sealing lips in the performing the sealing function. As a result of this specific definition of the o-spring the inspection criteria for the o-spring will not have the same inspection requirements as a true o-ring seal. What is critical with an o-spring is strictly the compression set resistance of the elastomer and that is all. The elastomer when installed in the PolyPak shell and the PolyPak is installed in the metal boundary dimensions, the PolyPak shell and the o-spring will get squeezed out of shape to match the amount of squeeze designed into the PolyPak Seal. This deformation due to installation squeeze is resisted by the o-spring elastomer. The o-spring no longer is round but takes the shape of a pear. But, the o-spring wants to be round and will therefore push back the sealing lips of the PolyPak Shell. These forces are translated into the sealing lips of the PolyPak Shell thus causing the Shell compound to conform to the metal irregularities and thus a seal takes place. Over time and with heat the o-spring elastomer will take a compression set and will lose its ability to push back on the Sealing lips. Seepage or weeping will then progressively increase until it is no longer tolerable by the application. This occurrence is not a short time frame but occurs over years of service. High temperatures will increase the speed of the onset of the compression set issue. Also in applications there is a helping situation which occurs with most fluids. Elastomers including the o-spring will tend to absorb some of the fluid or swell slightly. This swelling tends to offset some of the onset of compression set. This is helpful for sealing. But if the swelling goes beyond the amount allowed for the groove volume then swelling becomes a detrimental problem. The o-spring then is not an o-ring but is needed to provide a spring for the PolyPak Shell compound. For this reason tougher Shell materials can be used or higher durometer Shell materials may be used or tougher Shell materials can be used all to make the PolyPak last longer than just an o-ring seal by itself.

Frequently Asked Questions

General	Answer
What is the minimum pressure a Polymyte PolyPak must see in order to energize the lips?	A PolyPak seal is classified as what we call a “squeeze type seal”. From the time the PolyPak is installed into the groove the sealing lips are compressed between the two metal walls. With the o-spring energizer wanting to be round but in fact taking the shape of a pear the o-spring pushes back making the lips of the PolyPak conform to the metal irregularities. With this conformity the sealing function takes place. This occurs from the moment the seal is installed into the gland. It does not take any system pressure to activate the sealing lips. They are activated by the o-spring energizer. It is this reason that PolyPak seals are very good for low- or no-pressure situations. If the PolyPak is not seated in the bottom of the groove it might take some pressure to seat the seal. About 45 lbs. per inch of diameter would be required to move a Type B PolyPak to seat it in the bottom of the gland if it is not seated from installation. Interestingly enough when a PIP Ring is used and there is pressure from the back side of the PolyPak the PolyPak and PIP ring together must move the free space distance allowed in the gland to move the sealing set to the new bottom of the gland. So you will see a small hesitation while the seal set moves.
What is the suggested method for installation of Polymyte® PolyPak seals, when the seal does not stretch over the piston?	The suggested method for installing piston seals can be found on in Section 2, Pg. 2-16 of the Fluid Power Seal Design Guide (EPS 5370). A steel expanding mandrel, along with a plastic pushing device are the tools required. Using this method, the seal will stretch on the mandrel as it is pushed down the cone shaped surface. This procedure must be performed in a fluid, quick motion to ensure the Polymyte does not take a set in the stretched position. Be cautious when pushing the seal of the mandrel, as this creates a pinch point.
Can the PolyPak profile seal at pressures up to 15,000 psi, if an extrusion gap exists that is slightly larger than the recommended design?	Yes, PolyPaks with the Deep (DPP) or Type B (BPP) design are capable of handling the high pressures. The way we surpass the typical limits of PolyPak seals is by incorporating a positively actuated backup ring in the heel of the PolyPak seals. The W4672 backup ring compound is rated for 10,000 psi. We also make these style of backup ring out of our PEEK compound W4685 for limits up to 15,000 psi.

General	Answer
Are gland design changes necessary when a backup ring is added to a PolyPak® seal?	Yes, the groove width would need to be lengthened in order to accommodate the backup ring. Please reference the Fluid Power Seal Design Guide (Catalog EPS5370) for gland design recommendations.
When a backup ring is required in a PolyPak application, do the dimensions of the PolyPak change?	This is dependent on which backup design is chosen for the application. When a modular or wedge type backup is used, the dimensions of the PolyPak do not change. If a positive backup groove is molded into the PolyPak heel, then the dimensions of the PolyPak do change. Please note a new mold must be tooled to create a positive backup groove on the PolyPak itself.
Can a PolyPak seal with a PIP® ring be used in an application were equal pressure is applied to both sides of the seal?	Yes, a PolyPak seal with a PIP ring can seal equal, bidirectional pressure. Parker has tested the combination Type B PolyPak seal with PIP Ring to 20,000 psi.
Can back-up rings and PIP Rings be solid/un-split, with no cuts?	Backup rings can be made either way depending on the compound. Compounds Polymyte Z4652D65 and P4617D65 can be continuous as PIP or modular backup rings. These compounds can be stretched over the piston or folded up for rod applications. Other materials such as PEEK, Nylon, and POM must be split (skive cut) for installation purposes.
Can the existing mold that made a Deep PolyPak (DPP) be machined to make it a Type B (BPP) mold?	No, it is more cost effective to make a new mold. Here's why: Standard PolyPak design is a square in shape and has the smallest lip cross section squeeze. This standard style has a straight cut, flat lip configuration. The Deep Style PolyPak, is taller than the Standard Polypak, but has a wider lip cross-section and thus more squeeze over a Standard PolyPak. The lip style is also straight cut, flat. The Type B Style PolyPak design has the most squeeze of the PolyPak styles. The lips are bevel cut The height of the Type B is usually the same as the Deep Style and thus, a new cap would have to be built with the bevel design made into the cap.

General	Answer
From what materials are back- up rings made?	Back-up rings are made out of the following materials: P4617D65 Hard Molythane® 10,000 psi Continuous/skive cut Z4652D65 Hard Polymyte® 15,000 psi Continuous/skive cut W4738 Lubricated PEEK 15,000 psi Split W4655 Nylon 6,6 with MoS_2 10,000 psi Split W4672 POM 10,000 psi Split W4685 PEEK 30,000 psi Split 4738 Lubricated PEEK 15,000 psi Split Reference Section 3 of Parker's Fluid Power Seal Design Guide, Catalog EPS5370, for more detailed material specifications.
Rotary Shaft Seals: Is a cover plate required to retain Clipper® seals since they do not have a metal shell?	No, normally a cover plate is not required. The design of the aramid fiber composite OD on the Clipper seals provides adequate bore retention force without the need for a cover plate.
Rotary Shaft Seals: "Which way should we install the seals?"	That depends on your primary purpose. In general, the lip should face the bearing/oil if your main purpose is to retain oil. If some oil 'weeping' is okay and your main goal is to exclude contaminants, you should face the lip towards the outboard side.
Rotary Shaft Seals: Does Parker offer a split oil seal that can be used to retrofit a gearbox in the field?	Yes, Parker's Clipper® Oil Seal can be split and installed in the field without uncoupling equipment. It is important to note that once split, the seal is no longer 'perfect' and weeping may occur near the split in oil lubricated systems. It is not recommended to use a split seal in a flooded application.
Are ProTech™ bearing isolator seals suitable for grease lubricated applications? If so, what about vertical down grease applications?	Yes, ProTech is typically suitable for grease lubricated applications, even in vertical orientations. If the bearing are greased only during assembly and then left to run, a standard seal is typically used. However, if there is any type of grease purge operation, Parker recommends using a specifically designed seal to handle this process.

Frequently Asked Questions

General	Answer
Are seal retention features, such as bolt on plates, required to keep ProTech™ seals secured in the gland?	Typically no, The o-rings on the outer diameter of ProTech seals provide positive bore retention. Contact Parker Engineering to review your particular applications.
Are ProTech seals suitable for underwater applications?	No, ProTech seals are not recommended for use in water based applications.
Where can I find specifications for ProTech seals? Are they in the catalog?	Situation: Customer asks: Can you send me the specification for the seal: LSM-1800-2100-5-1. I cannot find it from product catalog. Specs for the LS can be found on page 8-22 of our Rotary Seal Design Guide, Catalog EPS 5350. The part numbering nomenclature is on page 8-18. A description of the seal materials can be found on pages 8-14 and 8-15. A description of the O-ring materials can be found on pages 8-16 and 8-17.
Underwater Sealing and ProTech Bearing Isolators	Situation: Customer Inquiry: We have a customer that is using pillow block SNH 526 under water. Does Parker have a ProTech bearing isolator seal for such an application? No, we do not have a ProTech design for the application. Even the flooded ProTech design is not intended to be used under water.

General	Answer
ProTech™ Bearing Isolators: Standard vs. Custom Seals	Situation: Customer has an inquiry similar to: I need an LS profile seal, but I do not see a part number listed in section F of your EPS 5350 catalog. My shaft diameter is 1.750" and my bore diameter is 3.050" and I need your standard PTFE material with FKM O-rings. Can you provide a seal to these dimensions? If so, will it be considered a custom product? The part numbers listed in section F are a small portion of available standard sizes for ProTech. The best way to determine whether your seal is a standard product is to look at the product pages in section 8. For the LS profile, see table 8-11 on page 8-22. First, subtract your shaft diameter from your bore diameter : 3.050 - 1.750 = 1.300. We will call this our 'bore adder' and will use it later. Once you have done this, look at column 'A' in the table and find the row that corresponds to your shaft diameter. 1.750 fits within the range in the first row (0.500-3.000). Next, look in column 'B' on the same row and you will see a range of 'bore adders' considered standard for any seal with a shaft diameter between 0.500" and 3.000". For this example, the first row in column 'B' shows a minimum adder of 0.626" and a maximum adder of 1.500". Since we calculated 1.300 for our bore adder, we can see that it falls between the minimum (.626) and maximum (1.500) so this part will be considered a standard seal. The rest of the columns in the table will provide other dimensions as called out on the seal cross section image. You can now construct your part number using the nomenclature on page 8-18: LSE-1750-3050- 1-1. Note: Parker engineering can determine if a custom solution is available if your dimensions fall outside of the standard size range.
How much force is applied by the V-spring in a FlexiSeal™?	The approximate spring force per linear inch of spring length is a follows: Nominal Cross Section — Lbs. force per linear inch 1/16 — 8.0 lbs/inch 3/32 — 13.0 lbs/inch 1/8 — 13.5 lbs/inch 3/16 — 6.5 lbs/inch 1/4 — 6.5 lbs/inch
Can I take out some of the empty space in the seal groove?	The void space we recommend in the gland allows for the seal to grow under thermal expansion (rubber expands 10x or more than the metal it sits in) as well as any swell the elastomer experiences due to fluids with which it comes in contact. Expanding elastomers can create forces strong enough to deform the metal gland they are sealing.

Frequently Asked Questions

General	Answer
What is the difference between the Clipper® Oil Seal profiles LPD and LUP?	Both are single lip spring loaded designs. The LUP is a newer design with slightly modified geometry. Operationally there is no difference in performance.
Can a Clipper Oil Seal be used in sub sea applications?	It depends. We have materials suitable for saltwater applications, but pressure must be evaluated. Standard Clipper Seals have been used at depths of 5,000 feet in systems with pressure compensation devices, which maintain the differential pressure across the seal at 3-7 psi. If there is no pressure compensation device and the seal will see full pressure due to depth, an alternate Parker sealing system may be required.
I need an SS profile Clipper Oil Seal, but you aren't tooled on the correct size. Can I use an LUP instead?	You can generally use an LUP in place of an SS profile, but we recommend removing the garter spring from the LUP.
Many Clipper and Parker Oil Seals are rated to 7 psi. Can I use them at 10 psi?	You may be able to use a standard Clipper or Parker Oil Seal at 10 psi if speeds are slow and/or the seal only occasionally sees 10 psi. Note that seal life may be reduced. We recommend that you contact Parker and have an engineer review your application before using a seal beyond its recommended limits.
I purchased seals years ago that had a 'JM' molded into them. I recently purchased the same seal and it now has 'PH' molded into it. Have you changed the seal design?	No, the seal design has not changed. 'JM' is from JM Clipper Corporation, which was purchased by Parker Hannifin in 2005. The seals are made in the same molds and in the same factory, but now have PH to signify Parker Hannifin.

Frequently Asked Questions

General	Answer
Why do you need all of my gland information (including tolerances) for a simple back-up ring?	The back-up rings produced by Parker EPS are generally hard plastics (such as PTFE and PEEK). They do not squeeze out of the way in the same way that a rubber o-ring would. Knowing the customer's gland dimensions and tolerances will allow the Engineers to design a back-up that will fit into the customer's gland at the maximum material condition without overfilling the gland. This customer-centric design will provide the best extrusion resistance by being tailored to the provided gland dimensions.
Why aren't PEEK back-up rings for O-rings in the Fluid Power Catalog?	PEEK is a great back-up ring material, but it's also very hard. O-rings often get used in glands that do not match the recommendations given in Parker's O-ring handbook. Because of this, it's safer to size PEEK back-ups on a case-by-case basis to ensure that the back-up is not too big (installation problems) or too small (doesn't act as a back-up).
Does Parker EPS Division offer compounds approved by the FDA for use in food applications?	Yes. Parker can provide FDA compliant materials per Title 21 CFR177.2600. The FDA does not test, certify or approve any specific compound or material for use in food applications. However, Parker has materials which are compliant with FDA requirements for use in food applications such as EPDM, FKM, proprietary mineral filled PTFE, stainless steel, and silicone.

What is an IP rating?

IP or “Ingress Protection” ratings are standards established by the International Electromechanical Commission. As per IEC Publication 528, the following is a recap of the “Degrees of Protection that enclosures of a product are designed to provide when properly installed.”

The degree of protection is indicated by two letters (IP) and two numerals. The first numeral corresponds to tests for degrees of protection against solid foreign objects (dust), and the second numeral corresponds to tests for degrees of protection against the ingress of water with harmful effects. The ratings are summarized as follows:

First Numeral	Protection against foreign objects (dust)	Second numeral	Protection against water
0	None	0	None
1	Solid objects > 50 mm (large)	1	Vertically falling drip water
2	Solid objects >12.5 mm (medium)	2	Vertically falling drip water tipped up to 15” from its normal position
3	Solid objects >2.5 mm (small)	3	Atomized water
4	Solid objects >1mm (grain-type)	4	Spray water
5	Dust protected	5	Hose directed water
6	Dust-proof	6	Strong water jets
		7	Dipped in water
		8	Submerged in water
		9	Close-range high pressure, high temp (steam) spray

Does Parker provided dimensional CAD drawings of seal designs?

Per EPS policy regarding proprietary information, CAD drawings complete with design envelope information are not distributed. Upon request, however, we may p rovide a CAD drawing containing inspection dimension information.

What is “Tg shift” as it relates to pressure?

Tg shift (or glass trnasition temperature shift) is a phenomenon associated with elastomers becoming stiffer as the pressure being sealed increases. A material’s glass transition temperature can be used as a guide for predicting low temperature sealability. As pressure increases, the elastomer’s useful lower temperature limit rises, meaning it will no longer work at the published temperature limit. As a rule of thumb, we say the glass transition temperature (Tg) increases by one degree Celsius for each 750 psi being sealed.

What can be done if the shaft on my rotary equipment is damaged or worn?	It's always good practice to have a refurbishing procedure in the event a rotary shaft experiences wear. Wear can come in many forms so it's important to establish the severity of the wear before proceeding with a repair procedure. Following are suggested steps to take in determining shaft wear severity: 1. Thoroughly clean the shaft to remove any debris or build up that may have worked itself into the damaged area. 2. Once the surface is clean, visually inspect the area and run your finger over the worn area. 3. If the worn area cannot be felt, or a finger nail barely catches the surface, then the area can usually be repaired with a simple polishing process. 4. If the worn area is deeper with visual grooving or pitting, then a more involved repair operation should be considered. Determining the extent of wear is only half of the battle. The next step should be determining whether the repair process can be done in place without disturbing the equipment, or if the shaft needs to be completely removed. In either case, the repairer must be able to physically access the worn area and the shaft must spin freely on its own via the aid of the equipment it's installed into or by a lathe. In the case of slight surface scuffing or scoring, an emery cloth and a little bit of lubricant at slow speeds should get rid of most surface imperfections. However, if there is heavy wear a turning operation may be required to attain a suitable and workable finish. If minimal material is removed, a chrome plating and polishing operation could be performed. If a significant amount of material is removed, then material can be added to the shaft via a welding operation which can be turned/milled down and polished to the original dimension and recommended surface finish of the shaft. (See Section 2 of Parker's Rotary Shaft Seal Design Guide, Catalog EPS5350, for shaft surface finish recommendations.) If that is not a viable option, then a metal replacement sleeve could be press fit onto the shaft.

SALES & MARKETING QUESTIONS:

General	Answer
How do I order hard copies of EPS Division's literature?	All of EPS Division's current literature is available online at www.parker.com/eps, under the "Literature" tab. Since digital files may be updated intermittently, we recommend that you bookmark frequently referenced documents rather than rely on static downloaded files so that you always have the most recently updated document. References to date of last update are noted on each page of catalogs as well as on back covers of literature documents. In an effort to be green, EPS Division has chosen to make only certain of its literature items available by hard copy. If that is an available option, simply click the "Add to Cart" button and edit your cart to indicate the desired quantity.
Can I electronically submit a drawing and Request for Quote?	Yes. The following is a link to our web portal for submitting an RFQ: https://www.formrouter.net/forms01@PARKR/SPPI.html Please fill out Parker's Design Action Request "DAR" form and attach it to your RFQ. If you have multiple files to attach, including the completed DAR form and other drawings or relevant information, you may attach a ZIP file containing multiple documents. You may download a PDF file or WORD document of Parker EPS Division's Design Action Request Form "DAR" by clicking the following links: PDF format: http://www.parker.com/literature/Engineered%20Polymer%20Systems/dar.pdf WORD format: http://www.parker.com/literature/Engineered%20Polymer%20Systems/dar.doc

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Parker Hannifin Corporation
Engineered Polymer Systems Division
phone 800 233 3900
eps-ccare@parker.com
www.parker.com/eps