

Parker Blowout Preventer Seal Solutions

**Time-Tested PolyPak™
Sealing Systems**

No. 5211B-USA

The time-tested and performance proven PolyPak™ Sealing System has been used worldwide to seal critical energy, oil and gas exploration and production applications. The most notable oilwell application is the Blowout Preventer (BOP). Parker's patented PolyPak provides the positive sealing these critical drilling applications require.

PolyPak™ Advantages

In addition to providing superior sealing in vacuum, low and high pressure applications, the PolyPak offers a number of distinct advantages over conventional symmetrical or non-symmetrical U-Packings:



- The PolyPak's O-spring centers the seal in the gland. The resulting high percentage of seal gland fill controls rolling or twisting in the gland.
- At low or high pressure extremes, the O-spring maintains lip loading on both I.D. and O.D. of the seal interface.
- The PolyPak seal can be stretched or squeezed to accommodate oversized cylinder bores and undersized rods. As long as the seal cross section is correct in relation to the radial groove dimensions, the PolyPak will compensate and maintain proper lip loading.
- The broad range of available PolyPak materials ensures the proper combination of abrasion, extrusion, temperature resistance and fluid compatibility, which results in higher sealability and longer seal life.

Type "B"

Type B PolyPak seals add a back-bevel lip to the Deep PolyPak shape and thus align the seal interface near the centerline of the O-spring to provide increased squeeze and sealability. This highly stable configuration provides excellent low pressure sealing as well as "super-pressure" capability. Type B PolyPaks are available in many



Parker materials and all sizes from 1/8" to over 90" diameter. For recommended gland dimensions, refer to our PolyPak™ Seal Design Handbook (Catalog EPS 3800/US), or call us at (801) 972-3000.

PIP Seal

Parker's patented PIP seal combines a Type B PolyPak with a "pressure inverting pedestal," which converts the Type B seal into a bi-directional device that:



- Requires only one groove.
- Can be installed on a one-piece piston in most applications.
- Saves space by increasing bearing length of piston and reducing the number of components required.
- Eliminates possible pressure trap associated with two "squeeze type" seals.
- Can be installed in a bi-directional seal system replacing two standard PolyPaks at a considerable savings in both machining and seal cost.

For additional information on the PIP seal, see Parker EPS Bulletin 5218B-USA.

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Parker Materials For BOP Sealing Solutions

MATERIAL	TEMP RANGE °F	HARDNESS	COMMENTS/APPLICATIONS
Plastic Alloy Materials			
PolyMyte™ Z4651 Z4674	-65° + 275°	60 Shore D	High tear strength, abrasion and extrusion resistance. Excellent resistance to petroleum fluids, many phosphate esters, some chlorinated hydraulic fluids, up to 180° in water.
Elasto-Plastic Materials			
RESILON™ HT P4300	-65° +275°	90 Shore A	High performance PPDI-based, high temperature, low compression set, excellent rebound resilience.
RESILON™ WR P4301	-65° +275°	90 Shore A	High performance PPDI-based, hydrolysis resistant (e.g., hot water, 195°).
Molythane™ P4615	-65° +200°	90 Shore A	Polyurethane compounded for high extrusion resistance. Excellent wear and abrasion resistance
PTFE - (Polytetrafluorethylene)			
Polon 08	-360° +550°	67 Shore D	Carbon fiber filled PTFE. Dynamic applications. High wear material with low abrasion. Back-up ring devices.
Other Parker Materials			
MolyGard™ W4650	-65° +250°	120 Rockwell	Proprietary compound of filled nylon. Load bearing and anti-extrusion devices.
UltraCOMP™ W4685	-65° +500°	126 Rockwell	High temperature and high pressure compound. Good extrusion resistance. Back-up ring devices and special sealing elements.

Seal Compound/ Extrusion Gap Pressure Rating Matrix

Parker premiere materials, used in PolyPaks and anti-extrusion rings, possess sealing capabilities (pressure ratings) that vary according to temperature range and extrusion gap/clearance. The table below illustrates maximum pressure rating as it applies to a specific material and clearance.

Temperature	Extrusion Gap Size (inches)	PolyMyte Z4674D60	Molythane P4615A90	UltraCOMP™ W4685	Polon 08 Filled PTFE
100° F	0.004 (.008 diametral)	16,000	16,000	20,000	8000
	0.008 (.016 diametral)	16,000	16,000	20,000	3000
	0.015 (.030 diametral)	16,000	16,000	18,000	2000
	0.022 (.044 diametral)	12,800	10,800	16,000	1000
200° F	0.004 (.008 diametral)	16,000	16,000	20,000	6000
	0.008 (.016 diametral)	11,200	16,000	18,000	2000
	0.015 (.030 diametral)	9,000	6,400	14,000	1000
	0.022 (.044 diametral)	4,000	4,100	8,000	800
300° F	0.004 (.008 diametral)	7,200	5,400	15,000	4000
	0.008 (.016 diametral)	6,400	4,800	12,000	1500
	0.015 (.030 diametral)	4,000	2,400	8,000	750
	0.022 (.044 diametral)	3,200	1,200	5,000	400

NOTE: Customer test and validation is the only means of ensuring a seal recommendation will work in an application. The above table should be used for reference purposes only.

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