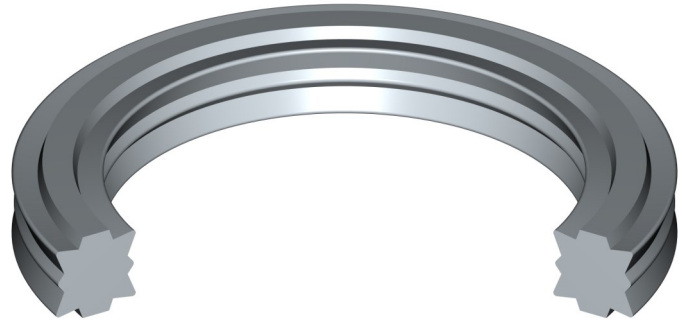
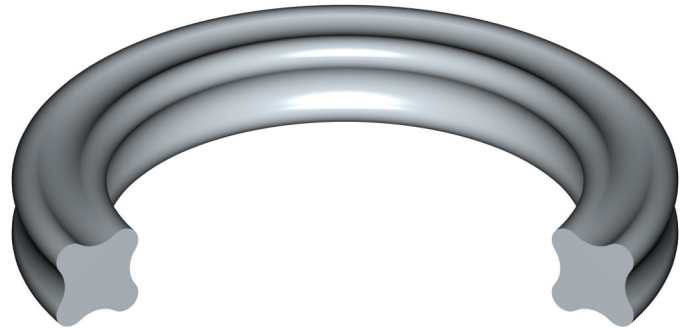




# ***X-Ring & Multiseal®***

---

## Low Friction Seals





**X-Ring &  
Multiseal®**  
Low Friction Seals



## **Low Friction Compression Seals – Run Circles Around O-Rings!**

After years of concentrated research, PAI has perfected synthetic rubber hydraulic and pneumatic seals that are far superior to O-Rings. These packings were designed to overcome the weaknesses of O-Rings – such as high friction, spiral failures and leakage from compression set.

PAI manufactures two types of low friction compression seals:

- Multiseal® bi-directional lip style seals
- X-Ring multidirectional lobed style seals

Both styles offer significant advantages over standard O-Rings, making them the choice for any application where you want to achieve a better, high performing seal.

## **What Makes Multiseal® Low Friction Seals and X-Ring Seals Better**

- A better seal – With their multi-lobed designs, they provide more sealing surfaces than standard O-Rings.
- Increased life for the seal ring – With multiple seal points, less squeeze is required to provide an effective seal. This means less friction and wear which will increase seal life and lower maintenance costs.
- Prevents spiral failure – The square cross sections resist distortion called “spiral twist” that may be encountered when using O-Rings.
- Puts parting lines where they belong – Unlike an O-Ring, where the parting line is found on the only sealing surface, the parting lines of Multiseal® low friction seals and X-Ring compression seals are located in the center of the cross section away from the primary sealing surfaces.
- Better lubricant retention – The grooves on the inside and outside diameter of these rings retain lubricant thereby lowering friction and extending packing life.
- Saves space, reduces cost – One Multiseal® low friction seal can replace two U-Cups in many applications.
- Less force, better seal – Lower breakaway force and reduced operating pressures make them ideal in reciprocating applications.
- The right fit – Multiseal® low friction seals and X-Rings compression seals will fit in standard O-Ring grooves

Multiseal® is a registered trademark of Precision Associates, Inc.

### **Low Breakaway Pressures Solved with PAI's Multiseal**

Jim Viken of **Transclean Corporation** uses PAI's Multiseal® as a piston seal in their patented bi-directional hydraulic fluid exchange pump that is designed to operate in a range from 5 to 300 psi. This application requires very low breakaway pressures, good sealing, and minimal pressure drop due to seal drag on the cylinder wall.

PAI's Multiseal® works far better than any other product we tried! O-Rings produced too much resistance to piston movement for our low-pressure application. Quad Rings made some improvement, but still couldn't achieve the low resistance (i.e. drag) we were looking for. U-Cups generated too much drag when energized, plus we needed two of them since they are not bi-directional like the Multiseal®. The self-energizing Multiseal® quickly proved to be the best solution because it provides optimal sealing in low pressure as well as higher pressures without parasitical drag! By optimizing the gland for our application, we are able to achieve good sealing with very low drag through the full operating pressure range, with piston movement starting at less than 2 psi and extending to 300 psi. The Multiseal® provides a good seal with minimal pressure drop throughout the full pressure operating range of the pump.

### **Availability of PAI Low Friction Seals**

PAI's low friction seals are available “off the shelf” in our standard 70 durometer nitrile compound 5716. Most of our other 1,000+ compounds can be used to meet your special requirements.



**X-Ring &  
Multiseal®**  
Low Friction Seals



X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
4444-002		.050 ±.003	.042 ±.003	.142	3/64	3/64	9/64
4444-003		.060	.056 ±.004	.176	1/16	1/16	11/64
4444-004		.070	.070 ±.005	.210	1/16	5/64	13/64
4444-005		.070	.101	.241	1/16	7/64	15/64
4444-006	4-006	.070	.114	.254	1/16	1/8	1/4
4444-007	4-007	.070	.145	.285	1/16	5/32	9/32
4444-008	4-008	.070	.176	.316	1/16	3/16	5/16
4444-009	4-009	.070	.208	.348	1/16	7/32	11/32
4444-010	4-010	.070	.239	.379	1/16	1/4	3/8
4444-011	4-011	.070	.301	.441	1/16	5/16	7/16
4444-012	4-012	.070	.364	.504	1/16	3/8	1/2
4444-013	4-013	.070	.426	.566	1/16	7/16	9/16
4444-014	4-014	.070	.489	.629	1/16	1/2	5/8
4444-015	4-015	.070	.551 ±.007	.691	1/16	9/16	11/16
4444-016	4-016	.070	.614 ±.009	.754	1/16	5/8	3/4
4444-017	4-017	.070	.676	.816	1/16	11/16	13/16
4444-018	4-018	.070	.739	.879	1/16	3/4	7/8
4444-019	4-019	.070	.801	.941	1/16	13/16	15/16
4444-020	4-020	.070	.864	1.004	1/16	7/8	1
4444-021	4-021	.070	.926	1.066	1/16	15/16	1 1/16
4444-022	4-022	.070	.989 ±.010	1.129	1/16	1	1 1/8
4444-023		.070	1.051	1.191	1/16	1 1/16	1 3/16
4444-024	4-024	.070	1.114	1.254	1/16	1 1/8	1 1/4
4444-025		.070	1.176 ±.011	1.316	1/16	1 3/16	1 5/16
4444-026		.070	1.239	1.379	1/16	1 1/4	1 3/8
4444-027		.070	1.301	1.441	1/16	1 5/16	1 7/16
4444-028	4-028	.070	1.364 ±.013	1.504	1/16	1 3/8	1 1/2
4444-029	4-029	.070	1.489	1.629	1/16	1 1/2	1 5/8
4444-030		.070	1.614	1.754	1/16	1 5/8	1 3/4
4444-031		.070	1.739 ±.015	1.879	1/16	1 3/4	1 7/8
4444-032		.070	1.864	2.004	1/16	1 7/8	2
4444-034		.070	2.114 ±.018	2.254	1/16	2 1/8	2 1/4
	4-036	.070	2.364	2.504	1/16	2 3/8	2 1/2
	4-039	.070	2.739 ±.020	2.879	1/16	2 3/4	2 7/8
4444-042		.070	3.239 ±.024	3.379	1/16	3 1/4	3 3/8
	4-043	.070	3.489	3.629	1/16	3 1/2	3 5/8
	4-044	.070	3.739 ±.027	3.879	1/16	3 3/4	3 7/8

**PAI Sealing Tip #1**

Whether you choose Multiseal® low friction seals or X-Ring compression seals, you can reduce breakaway and operating pressures even more by selecting internally lubed compounds.



**X-Ring &  
Multiseal®**  
Low Friction Seals



X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
4444-102		.103 ±.003	.050 ±.005	.256	3/32	1/16	1/4
4444-103		.103	.081	.287	3/32	3/32	9/32
4444-104		.103	.112	.318	3/32	1/8	5/16
4444-105		.103	.143	.349	3/32	5/32	11/32
4444-106		.103	.175	.381	3/32	3/16	3/8
4444-107		.103	.206	.412	3/32	7/32	13/32
4444-108		.103	.237	.443	3/32	1/4	7/16
4444-109	4-109	.103	.299	.505	3/32	5/16	1/2
4444-110	4-110	.103	.362	.568	3/32	3/8	9/16
5444-610		.103	.404	.610	3/32		
4444-111	4-111	.103	.424	.630	3/32	7/16	5/8
4444-112	4-112	.103	.487	.693	3/32	1/2	11/16
4444-113	4-113	.103	.549 ±.007	.755	3/32	9/16	3/4
5444-804		.103	.598	.804	3/32		
4444-114	4-114	.103	.612 ±.009	.818	3/32	5/8	13/16
5444-860		.103	.654	.860	3/32		
4444-115	4-115	.103	.674	.880	3/32	11/16	7/8
5444-917		.103	.711	.917	3/32		
4444-116	4-116	.103	.737	.943	3/32	3/4	15/16
4444-117	4-117	.103	.799 ±.010	1.005	3/32	13/16	1
4444-118	4-118	.103	.862	1.068	3/32	7/8	1 1/16
4444-119	4-119	.103	.924	1.130	3/32	15/16	1 1/8
4444-120		.103	.987	1.193	3/32	1	1 3/16
4444-121	4-121	.103	1.049	1.255	3/32	1 1/16	1 1/4
4444-122	4-122	.103	1.112	1.318	3/32	1 1/8	1 5/16
4444-123		.103	1.174 ±.012	1.380	3/32	1 3/16	1 3/8
4444-124	4-124	.103	1.237	1.443	3/32	1 1/4	1 7/16
4444-125	4-125	.103	1.299	1.505	3/32	1 5/16	1 1/2
4444-126		.103	1.362	1.568	3/32	1 3/8	1 9/16
4444-127	4-127	.103	1.424	1.630	3/32	1 7/16	1 5/8
4444-128	4-128	.103	1.487	1.693	3/32	1 1/2	1 11/16
4444-129	4-129	.103	1.549 ±.015	1.755	3/32	1 9/16	1 3/4

Please contact Precision Associates for sizes not listed.

### Availability of PAI Low Friction Seals

PAI's low friction seals are available "off the shelf" in our standard 70 durometer nitrile compound 5716. Most of our other 1,000+ compounds can be used to meet your special requirements.



**X-Ring &  
Multiseal®**  
Low Friction Seals



X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
4444-130	4-130	.103 ±.003	1.612 ±.015	1.818	3/32	1 5/8	1 13/16
4444-131		.103	1.674	1.880	3/32	1 11/16	1 7/8
4444-132		.103	1.737	1.943	3/32	1 3/4	1 15/16
4444-133	4-133	.103	1.799	2.005	3/32	1 13/16	2
4444-134		.103	1.862	2.068	3/32	1 7/8	2 1/16
4444-135		.103	1.925 ±.017	2.131	3/32	1 15/16	2 1/8
4444-136	4-136	.103	1.987	2.193	3/32	2	2 3/16
4444-137		.103	2.050	2.256	3/32	2 1/16	2 1/4
4444-138	4-138	.103	2.112	2.318	3/32	2 1/8	2 5/16
	4-140	.103	2.237	2.443	3/32	2 1/4	2 7/16
	4-142	.103	2.362 ±.020	2.568	3/32	2 3/8	2 9/16
4444-143		.103	2.425	2.631	3/32	2 7/16	2 5/8
4444-144	4-144	.103	2.487	2.693	3/32	2 1/2	2 11/16
4444-145		.103	2.550	2.756	3/32	2 9/16	2 3/4
4444-150		.103	2.862 ±.022	3.068	3/32	2 7/8	3 1/16
	4-152	.103	3.237 ±.024	3.443	3/32	3 1/4	3 7/16
4444-153		.103	3.487	3.693	3/32	3 1/2	3 11/16
4444-154		.103	3.737 ±.028	3.943	3/32	3 3/4	3 15/16
4444-155		.103	3.987	4.193	3/32	4	4 3/16
4444-159	4-159	.103	4.987 ±.035	5.193	3/32	5	5 3/16
	4-160	.103	5.237	5.443	3/32	5 1/4	5 7/16
4444-163		.103	5.987	6.193	3/32	6	6 3/16
	4-165	.103	6.487 ±.040	6.693	3/32	6 1/2	6 11/16
	4-166	.103	6.737	6.943	3/32	6 3/4	6 15/16
4444-168		.103	7.237 ±.045	7.443	3/32	7 1/4	7 7/16
4444-170		.103	7.737	7.943	3/32	7 3/4	7 15/16
4444-177		.103	9.487	9.693	3/32	9 1/2	9 11/16

Please contact Precision Associates for sizes not listed.

### PAI Sealing Tip #2

Breakaway pressures will be reduced by using less compression (see gland design charts for more information).



**X-Ring &  
Multiseal®**  
Low Friction Seals



X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
4444-201		.139 ±.003	.171 ±.005	.449	1/8	3/16	7/16
4444-202		.139	.234	.512	1/8	1/4	1/2
4444-203		.139	.301	.579	1/8	5/16	9/16
4444-204	4-204	.139	.359	.637	1/8	3/8	5/8
4444-205	4-205	.139	.421	.699	1/8	7/16	11/16
4444-206	4-206	.139	.484	.762	1/8	1/2	3/4
4444-207	4-207	.139	.546 ±.007	.824	1/8	9/16	13/16
4444-208	4-208	.139	.609 ±.009	.887	1/8	5/8	7/8
4444-209	4-209	.139	.672	.950	1/8	11/16	15/16
4444-210	4-210	.139	.734 ±.010	1.012	1/8	3/4	1
4444-211	4-211	.139	.796	1.074	1/8	13/16	1 1/16
4444-212	4-212	.139	.859	1.137	1/8	7/8	1 1/8
4444-213	4-213	.139	0.921	1.199	1/8	15/16	1 3/16
4444-214	4-214	.139	0.984	1.262	1/8	1	1 1/4
4444-215	4-215	.139	1.046	1.324	1/8	1 1/16	1 5/16
4444-216	4-216	.139	1.109 ±.012	1.387	1/8	1 1/8	1 3/8
4444-217	4-217	.139	1.171	1.449	1/8	1 3/16	1 7/16
4444-218	4-218	.139	1.234	1.512	1/8	1 1/4	1 1/2
4444-219	4-219	.139	1.296	1.574	1/8	1 5/16	1 9/16
4444-220	4-220	.139	1.359	1.637	1/8	1 3/8	1 5/8
4444-221	4-221	.139	1.421	1.699	1/8	1 7/16	1 11/16
4444-222	4-222	.139	1.484 ±.015	1.762	1/8	1 1/2	1 3/4
4444-223	4-223	.139	1.609	1.887	1/8	1 5/8	1 7/8
4444-224	4-224	.139	1.734	2.012	1/8	1 3/4	2
4444-225	4-225	.139	1.859 ±.018	2.137	1/8	1 7/8	2 1/8
4444-226	4-226	.139	1.984	2.262	1/8	2	2 1/4
4444-227	4-227	.139	2.109	2.387	1/8	2 1/8	2 3/8
4444-228	4-228	.139	2.234 ±.020	2.512	1/8	2 1/4	2 1/2
4444-229	4-229	.139	2.359	2.637	1/8	2 3/8	2 5/8
4444-230	4-230	.139	2.484	2.762	1/8	2 1/2	2 3/4
4444-231	4-231	.139	2.609	2.887	1/8	2 5/8	2 7/8

Please contact Precision Associates for sizes not listed.

**Availability of PAI Low Friction Seals**

PAI's low friction seals are available "off the shelf" in our standard 70 durometer nitrile compound 5716. Most of our other 1,000+ compounds can be used to meet your special requirements.





**X-Ring &  
Multiseal®**  
Low Friction Seals



X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
4444-232	4-232	.139 ±.003	2.734 ±.024	3.012	1/8	2 3/4	3
4444-233	4-233	.139	2.859	3.137	1/8	2 7/8	3 1/8
4444-234	4-234	.139	2.984	3.262	1/8	3	3 1/4
4444-235	4-235	.139	3.109	3.387	1/8	3 1/8	3 3/8
4444-236	4-236	.139	3.234	3.512	1/8	3 1/4	3 1/2
4444-237	4-237	.139	3.359	3.637	1/8	3 3/8	3 5/8
4444-238	4-238	.139	3.484	3.762	1/8	3 1/2	3 3/4
4444-239		.139	3.609 ±.028	3.887	1/8	3 5/8	3 7/8
	4-240	.139	3.734	4.012	1/8	3 3/4	4
	4-241	.139	3.859	4.137	1/8	3 7/8	4 1/8
4444-242		.139	3.984	4.262	1/8	4	4 1/4
4444-244		.139	4.234 ±.030	4.512	1/8	4 1/4	4 1/2
	4-245	.139	4.359	4.637	1/8	4 3/8	4 5/8
	4-248	.139	4.734	5.012	1/8	4 3/4	5
4444-249	4-249	.139	4.859 ±.035	5.137	1/8	4 7/8	5 1/8
	4-250	.139	4.984	5.262	1/8	5	5 1/4
	4-252	.139	5.234	5.512	1/8	5 1/4	5 1/2
	4-253	.139	5.359	5.637	1/8	5 3/8	5 5/8
	4-256	.139	5.734	6.012	1/8	5 3/4	6
	4-259	.139	6.234 ±.040	6.512	1/8	6 1/4	6 1/2
	4-260	.139	6.484	6.762	1/8	6 1/2	6 3/4
	4-262	.139	6.984	7.262	1/8	7	7 1/4
5444-7.419		.139	7.141	7.419	1/8		
4444-264		.139	7.484 ±.045	7.762	1/8	7 1/2	7 3/4
4444-265	4-265	.139	7.734	8.012	1/8	7 3/4	8
	4-269	.139	8.734 ±.050	9.012	1/8	8 3/4	9
	4-270	.139	8.984	9.262	1/8	9	9 1/4
5444-9.434		.139	9.156	9.434	1/8		

Please contact Precision Associates for sizes not listed.

### PAI Sealing Tip #3

*If you have a special application, we can design a special compound to help seal it.*



**X-Ring &  
Multiseal®**  
Low Friction Seals



X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
4444-312		.210 ±.005	.600 ±.009	1.020	3/16	5/8	1
4444-313		.210	.662	1.082	3/16	11/16	1 1/16
4444-316		.210	.850 ±.010	1.270	3/16	7/8	1 1/4
4444-320		.210	1.100 ±.012	1.520	3/16	1 1/8	1 1/2
4444-322		.210	1.225	1.645	3/16	1 1/4	1 5/8
4444-324	4-324	.210	1.350	1.770	3/16	1 3/8	1 3/4
4444-325	4-325	.210	1.475 ±.015	1.895	3/16	1 1/2	1 7/8
4444-326	4-326	.210	1.600	2.020	3/16	1 5/8	2
4444-327	4-327	.210	1.725	2.145	3/16	1 3/4	2 1/8
4444-328	4-328	.210	1.850	2.270	3/16	1 7/8	2 1/4
4444-329	4-329	.210	1.975 ±.018	2.395	3/16	2	2 3/8
4444-330	4-330	.210	2.100	2.520	3/16	2 1/8	2 1/2
4444-331	4-331	.210	2.225	2.645	3/16	2 1/4	2 5/8
4444-332	4-332	.210	2.350	2.770	3/16	2 3/8	2 3/4
4444-333	4-333	.210	2.475 ±.020	2.895	3/16	2 1/2	2 7/8
4444-334	4-334	.210	2.600	3.020	3/16	2 5/8	3
4444-335	4-335	.210	2.725	3.145	3/16	2 3/4	3 1/8
4444-336	4-336	.210	2.850	3.270	3/16	2 7/8	3 1/4
4444-337	4-337	.210	2.975 ±.024	3.395	3/16	3	3 3/8
4444-338	4-338	.210	3.100	3.520	3/16	3 1/8	3 1/2
4444-339	4-349	.210	3.225	3.645	3/16	3 1/4	3 5/8
4444-340	4-340	.210	3.350	3.770	3/16	3 3/8	3 3/4
	4-341	.210	3.475	3.895	3/16	3 1/2	3 7/8
	4-342	.210	3.600 ±.028	4.020	3/16	3 5/8	4
4444-343	4-343	.210	3.725	4.145	3/16	3 3/4	4 1/8
4444-344	4-344	.210	3.850	4.270	3/16	3 7/8	4 1/4
4444-345	4-345	.210	3.975	4.395	3/16	4	4 3/8
4444-346	4-346	.210	4.100	4.520	3/16	4 1/8	4 1/2
	4-347	.210	4.225 ±.030	4.645	3/16	4 1/4	4 5/8
	4-348	.210	4.350	4.770	3/16	4 3/8	4 3/4
4444-349	4-349	.210	4.475	4.895	3/16	4 1/2	4 7/8
	4-350	.210	4.600	5.020	3/16	4 5/8	5
4444-352	4-352	.210	4.850	5.270	3/16	4 7/8	5 1/4
4444-356		.210	5.350 ±.037	5.776	3/16	5 3/8	5 3/4
	4-357	.210	5.475	5.895	3/16	5 1/2	5 7/8
4444-361		.210	5.975	6.395	3/16	6	6 3/8
	4-363	.210	6.475	6.895	3/16	6 1/2	6 7/8
	4-366	.210	7.225 ±.045	7.645	3/16	7 1/4	7 5/8
	4-369	.210	7.975	8.395	3/16	8	8 3/8
4444-378		.210	10.475 ±.060	10.895	3/16	10 1/2	10 7/8

8 Please contact Precision Associates for sizes not listed.

Precision Associates, Inc.  
3800 Washington Ave. N  
Minneapolis, MN 55412

Phone: (612) 333-7464  
Fax: (612) 342-2417  
Toll: (800) 394-6590

[www.PrecisionAssoc.com](http://www.PrecisionAssoc.com)





**X-Ring &  
Multiseal®**  
Low Friction Seals



X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
4444-425	4-425	.275 ±.006	4.475 ±.033	5.025	1/4	4 1/2	5
4444-426		.275	4.600	5.150	1/4	4 5/8	5 1/8
4444-427		.275	4.725	5.275	1/4	4 3/4	5 1/4
4444-428	4-428	.275	4.850	5.400	1/4	4 7/8	5 3/8
4444-429	4-429	.275	4.975 ±.037	5.525	1/4	5	5 1/2
4444-430		.275	5.100	5.650	1/4	5 1/8	5 5/8
4444-431	4-431	.275	5.225	5.775	1/4	5 1/4	5 3/4
4444-432	4-432	.275	5.350	5.900	1/4	5 3/8	5 7/8
4444-433	4-433	.275	5.475	6.025	1/4	5 1/2	6
4444-434		.275	5.600	6.150	1/4	5 5/8	6 1/8
4444-435		.275	5.725	6.275	1/4	5 3/4	6 1/4
4444-436		.275	5.850	6.400	1/4	5 7/8	6 3/8
4444-437	4-437	.275	5.975	6.525	1/4	6	6 1/2
4444-438	4-438	.275	6.225 ±.040	6.775	1/4	6 1/4	6 3/4
4444-439	4-439	.275	6.475	7.025	1/4	6 1/2	7
4444-440		.275	6.725	7.275	1/4	6 3/4	7 1/4
4444-441	4-441	.275	6.975	7.525	1/4	7	7 1/2
4444-442		.275	7.225 ±.045	7.775	1/4	7 1/4	7 3/4
4444-443	4-443	.275	7.475	8.025	1/4	7 1/2	8
4444-444		.275	7.725	8.275	1/4	7 3/4	8 1/4
4444-445	4-445	.275	7.975	8.525	1/4	8	8 1/2
4444-446	4-446	.275	8.475 ±.055	9.025	1/4	8 1/2	9
4444-447		.275	8.975	9.525	1/4	9	9 1/2
4444-448	4-448	.275	9.475	10.025	1/4	9 1/2	10
4444-449		.275	9.975	10.525	1/4	10	10 1/2
4444-450	4-450	.275	10.475 ±.060	11.025	1/4	10 1/2	11
4444-451	4-451	.275	10.975	11.525	1/4	11	11 1/2
	4-453	.275	11.975	12.525	1/4	12	12 1/2
4444-454		.275	12.475	13.025	1/4	12 1/2	13

Please contact Precision Associates for sizes not listed.

### PAI Sealing Tip #4

Custom X-Rings or Multiseals can be manufactured for your specific application.

### Availability of PAI Low Friction Seals

PAI's low friction seals are available "off the shelf" in our standard 70 durometer nitrile compound 5716. Most of our other 1,000+ compounds can be used to meet your special requirements.



**X-Ring &  
Multiseal®**  
Low Friction Seals



### Non-Standard Size Low Friction Seals

X-Ring	Multiseal®	Actual Dimensions			Nominal Dimensions		
		C/S	ID	OD (Ref)	C/S	ID	OD
5444-085		.034 ±.003	.017 ±.003	.085			
5444-086		.036 ±.003	.013	.085			
5444-142*		.050 ±.003	.050 ±.004	.142			
5444-145		.049 ±.003	.047	.145			
	4-088	.071 ±.003	.174	.316			
5444-323		.089 ±.003	.145 ±.005	.323	2 mm	4 mm	8 mm
5444-335		.051 ±.003	.233	.335			
5444-377		.071 ±.003	.237	.379			
5444-403		.089 ±.003	.225	.403	2 mm	6 mm	10 mm
5444-481		.089 ±.003	.303	.481	2 mm	8 mm	12 mm
5444-488		.094 ±.003	.299	.487			
5444-610		.103 ±.003	.404	.610	3/32		
5444-804		.103 ±.003	.598 ±.007	.804	3/32		
5444-860		.103 ±.003	.654 ±.009	.860	3/32		
5444-917		.103 ±.003	.711	.917	3/32		
	4-830	.070 ±.003	.830 ±.010	.970	1/16		
5444-1.690		.065 ±.003	1.560 ±.013	1.690			
5444-4.173		.079 ±.003	4.016 .028	4.173			
		2 mm ±.1	108 mm ±.7	106 mm			
5444-6.525		.330 ±.006	5.975 ±.040	6.635	5/16	6	6 5/8
	4-3625	.210 ±.005	6.350	6.770	3/16		
5444-7.419		.139 ±.004	7.173	7.419	1/8		
5444-9.434		.139 ±.004	9.156 ±.050	9.434	1/8		
	4-13.854	.500 ±.010	13.854 ±.065	14.854			

\* Rectangular Cross Section

Please contact Precision Associates to see about making a special size for you.

### PAI Sealing Tip #5

Standard X-Rings can be manufactured in different color compounds when you require more than one polymer for different applications.

### Availability of PAI Low Friction Seals

PAI's low friction seals are available "off the shelf" in our standard 70 durometer nitrile compound 5716. Most of our other 1,000+ compounds can be used to meet your special requirements.



**X-Ring &  
Multiseal®**  
Low Friction Seals



### X-Ring Design Chart

PAI Size Number Range	4444-004 thru -042	4444-102 thru-159	4444-201 thru -265	4444-312 thru -352	4444-433 thru -451
Cross Section	.070 ±.003	.103 ±.003	.139 ±.004	.210 ±.005	.275 ±.006
Dynamic Seal Groove Depth	.062 -.002	.093 -.002	.126 -.002	.190 -.002	.254 -.002
Groove Width (Wall to Wall)	.080 ±.003	.117 ±.003	.157 ±.005	.237 ±.005	.310 ±.005
Static Seal Groove Depth	.057 -.002	.089 -.002	.120 -.002	.195 -.002	.250 -.002
Groove Width (Wall to Wall)	.080 ±.003	.117 ±.003	.157 ±.005	.237 ±.005	.310 ±.005
Diametric Clearance (max.)	.002	.003	.003	.004	.005
Radius (max.)	.010	.010	.015	.015	.015
Eccentricity (max.)	.002	.002	.003	.004	.005

The Gland dimensions provided are only intended to be a starting point for your design.  
We recommend that you test to meet your requirements in each application.

### Multiseal® Design Chart

PAI Size Number Range	4-006 thru 4-044	4-109 thru 4-166	4-204 thru 4-270	4-324 thru 4-369	4-425 thru 4-453
Cross Section	.070 ±.003	.103 ±.003	.139 ±.004	.210 ±.005	.275 ±.006
Piston Groove Groove Depth	.055 -.002	.091 -.002	.126 -.002	.191 -.002	.245 -.002
Groove Width (Wall to Wall)	.080 ±.003	.117 ±.003	.175 ±.005	.255 ±.005	.295 ±.005
Housing Groove Groove Depth	.057 -.002	.093 -.002	.129 -.002	.195 -.002	.250 -.002
Groove Width (Wall to Wall)	.080 ±.003	.117 ±.003	.175 ±.005	.255 ±.005	.295 ±.005
Rotating Seal (Housing Only) Groove Depth	.057 -.002	.093 -.002	.129 -.002	.195 -.002	.250 -.002
Groove Width (Wall to Wall)	.075 ±.003	.115 ±.003	.168 ±.005	.247 ±.005	.285 ±.005
Diametric Clearance (max.)	.002	.003	.003	.004	.005
Radius (max.)	.010	.010	.015	.015	.015
Eccentricity (max.)	.002	.002	.003	.004	.005

The Gland dimensions provided are only intended to be a starting point for your design.  
We recommend that you test to meet your requirements in each application.



3800 Washington Ave. North  
Minneapolis, MN 55412-2142

Toll Free: **1-800-394-6590**

**612-333-7464**

Sales: **612-334-9190**

FAX: **612-342-2417**

***info@PrecisionAssoc.com***

**Ask us about our complete line of product literature:**

- ***Standard O-Rings***
- ***Special Size O-Rings***
- ***U-Cups***
- ***V-Rings***
- ***Rod Wipers***
- ***X-Rings***
- ***8-Rings™***
- ***Multiseal® Low Friction Seals***
- ***Kurv-Bak™ Hard Rubber Backup Rings***
- ***Rubber Balls***
- ***Custom Moldings***
- ***Medical Grade Seals***

**With a long history in the rubber business, we've learned to be flexible. We'll bend over backwards to design custom solutions that meet your needs *precisely*.**

- **Over 1,000 different compounds**
- **More than 2,700 O-Ring Sizes**
- **On-Site Mold Shop**
- **Custom Molding**
- **99% on-time delivery**
- **ISO 14644-1 Class 7 Clean Room**