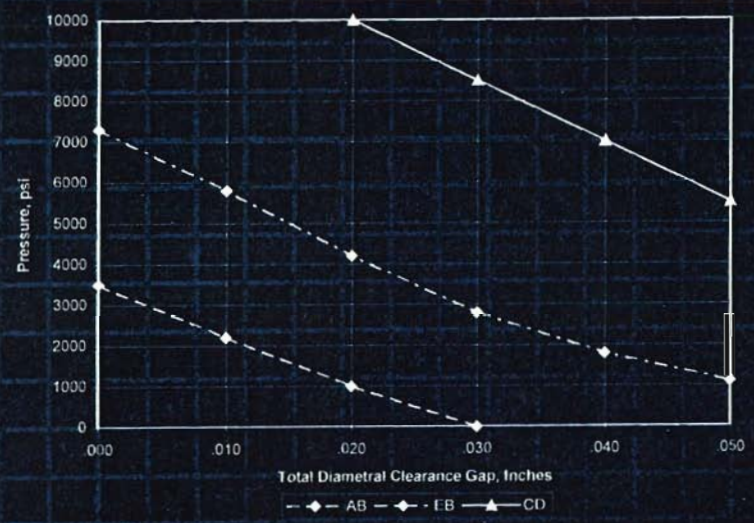
HPS INC

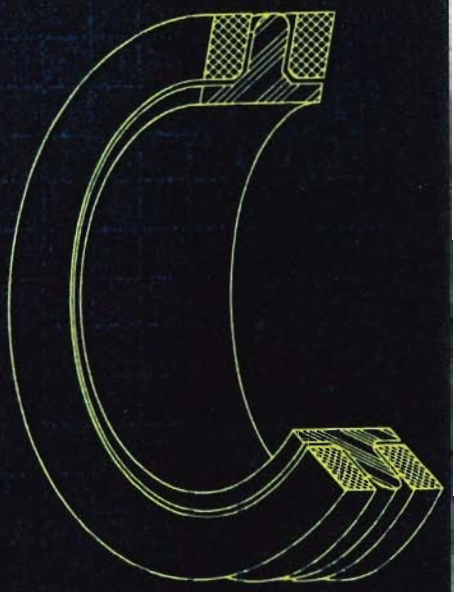
Leaders in Seal Technology

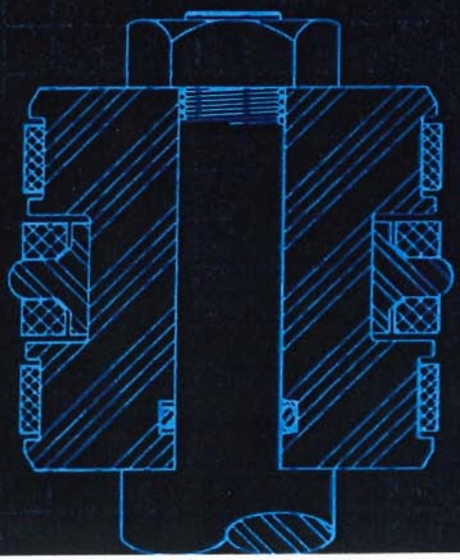
HYDRA-T™ SEALS

P207-N Hydra-T Backup Dynamic Extrusion Chart



Note: Above values for each material are a general guideline as to when Hydra-Lon material will start to extrude into concentric clearance gap. Pressures shown include peak pressures. It is recommended that a maximum of 75% of above gap values be used.





THE HYDRA-T™ SEAL

This series of high performance seal components is available in both the HT and AHT configurations. They are compact, bi-directional seal assemblies that link the resilience of an elastomeric "T" shaped compression seal with the extrusion resistance of thermoplastic back-up rings.

RETROFITS EXISTING GROOVES

The Hydra-T™ is available in sizes to retrofit existing O-ring or quad ring grooves. Narrow cross section seals are available for use in no back-up O-ring grooves. Intermediate and wide based seals are available for use in both one back-up and two back-up O-ring grooves.

COST EFFECTIVE

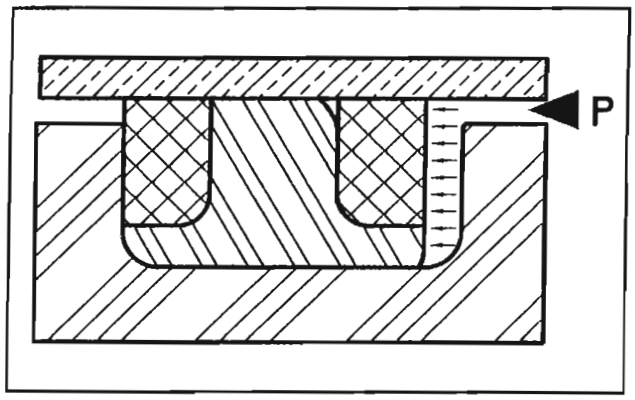
The combination of an elastomeric primary seal and extrusion resistant, thermoplastic back-up rings make the Hydra-T™ seal a cost effective alternative to less forgiving alternatives. The ability to retrofit existing grooves offers the designer an opportunity to upgrade products without any changes in metal dimensions.

WIDE SPECTRUM OF APPLICATIONS AND FLUIDS

The mating of advanced elastomeric and thermoplastic materials enables the Hydra-T™ to withstand broad temperature ranges (-65° F to + 400° F) as well as perform in a wide variety of fluid media. The integral, positively actuated back-up rings allow the Hydra-T™ to be used in applications with pressures and extrusion gaps far in excess of those acceptable for conventional seals.

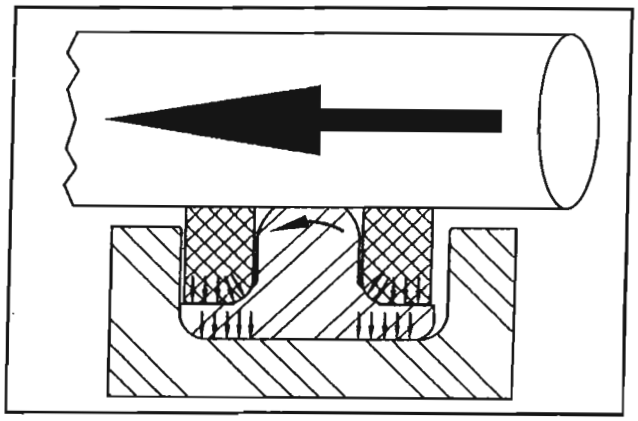
SEALABILITY

The Hydra-T™ is a compact bi-directional seal proven to be extremely effective over a wide range of pressures, extrusion gaps, fluids and temperatures. It is a pure compression seal and the high unit loading on its dynamic surface provides excellent low pressure sealability, while making it a true no-drift piston seal. The rounded surface of its contact area allows it to ride on a thin film of oil, effectively reducing friction and wear of the primary seal element.



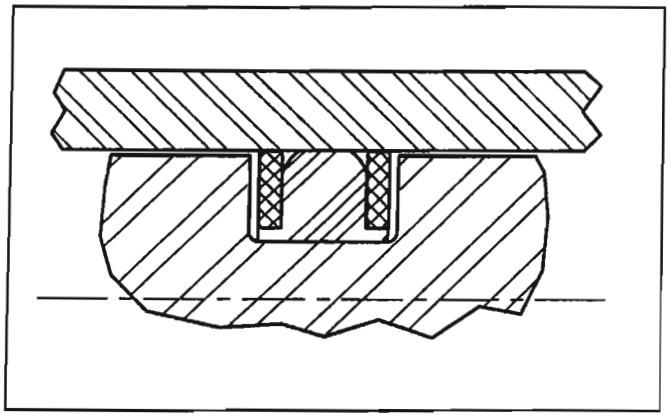
RESISTS EXTRUSION

The rigid thermoplastic anti-extrusion rings effectively prevent the elastomeric seal element from flowing into the extrusion gap. The performance of these back-ups is enhanced by the transmission of system pressure through the flange of the seal, which produces a radial force that effectively closes the gap.



RESISTS SPIRALING

The Hydra-T™ seal has a flat, stable static side profile. The rigid anti-extrusion rings "lock" the T-shaped elastomeric seal element in position and effectively prevents it from rolling or spiraling around its axis.



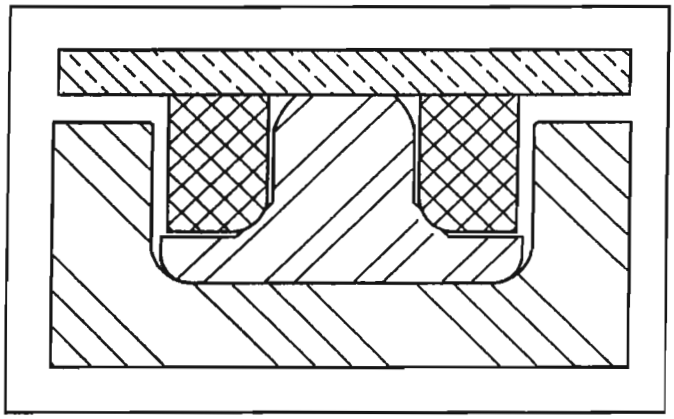
THE HT HYDRA-T™ SEAL

This is the narrowest member of the Hydra-T™ family. The HT was designed as a direct replacement for no back-up O-ring grooves. This allows manufacturers of hydraulic equipment to upgrade their products without having to change metal dimensions and with only minimal increase in cost.

ADVANTAGES OF THE HT HYDRA-T™ SEAL

Cost effective upgrade of older technology components such as O-rings and quad shaped rings.

- compact and bi-directional
- ease of installation
- pure compression seal using low compression set elastomers
- true "no drift" piston seal
- integral thermoplastic anti-extrusion rings are positively actuated
- rounded contact area reduces friction and wear
- variety of primary seal and back-up materials for use in a wide variety of applications



THE AHT HYDRA-T™ SEAL

The AHT design is primarily used in the intermediate and wide width configurations. These retrofit one back-up and two back-up O-ring grooves. They offer greater stability, wider sealing surfaces and heavier anti-extrusion back-up rings. In addition, the AHT offers the ultimate in Hydra-T™ seal performance — the use of radius back-up rings which mate with a chamfer at the intersection of the dynamic seal element and the seal flange. This mating of radius to chamfer effectively pre-loads the back-up while also eliminating a potential stress riser.

ADVANTAGES OF THE AHT HYDRA-T™ SEAL

- cost effective upgrade of older technology components
- compact and bi-directional
- ease of installation
- pure compression seal with low compression set elastomers
- true "no drift" piston seal
- rounded contact area reduces friction and wear
- variety of primary seal and back-up materials for use in a wide variety of applications
- radius thermoplastic back-up rings are pre-loaded to prevent extrusion and they effectively eliminate a potential stress riser.

PART NUMBERING SYSTEM

P — 1 3 3 3 — N AN C D

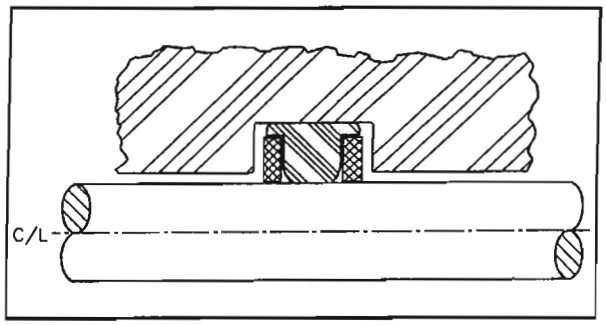
- P: TYPE — P=Piston, R=Rod
- 1: BACK-UP RING STYLE — 1=NON-RADIUS (HT), 2=RADIUS (AHT)
- 3 3 3: UNIFORM DASH NO. SIZE
- N: GROOVE WIDTH — N= NARROW (NO BACK-UP O-RING GROOVE), M= MEDIUM (1-BACK-UP O-RING GROOVE), W= WIDE (2-BACK-UP O-RING GROOVE)
- AN: ELASTOMER COMPOUND NO.
- C D: BACK-UP RING MATERIAL

MATERIAL SELECTIONS

SERVICE	TEMP. RANGE	HPS SEAL COMPOUND	DURO-METER	BASE POLYMER	COMPATIBLE BACK-UP MATL.
GENERAL PURPOSE HYDRAULIC OILS PETROLEUM BASED LUBRICATING OILS AIR, WATER*, GLYCOL ATF AND *SOLUBLE OILS	- 40° F TO + 250° F	AN	70A	NITRILE	CD - MOS_2 LOADED NYLON AB=VIRGIN TFE EB=GLASS FILLED TFE
MIL-H-5606 MIL-H-6083	- 65° F TO + 275° F	BN	70A	NITRILE	CD, AB, EB
GASOLINE KEROSENE	- 65° F TO + 160° F				
PHOSPHATE ESTER EMULSIONS	- 65° F TO + 250° F	EP	70A	EPR ETHYLENE PROPYLENE	CD, AB, EB
UNLEADED GASOLINE PYDRAUL 30E, 50E 80E, 115E	- 20° F TO +400° F	AV	75A	FLUORO-CARBON	AB, EB

*** DO NOT USE CD NYLON BACKUPS IN HIGH WATER CONTENT FLUIDS (HWCF)**

ROD SEAL GLAND DIMENSIONS



Rod seal gland dimensions are available upon request. The rounded contact area of T-seals which allows them to ride on a film of oil makes them questionable as a true "dry rod" seal. HPS offers several alternative rod seals which, while interchangeable with T-seal metal dimensions, significantly improve seal performance.

HYDRA-T™ SEAL

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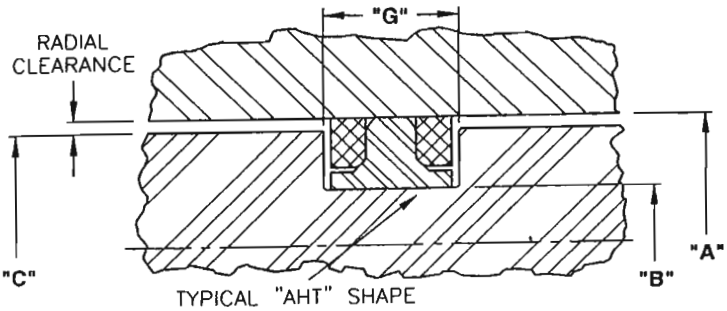
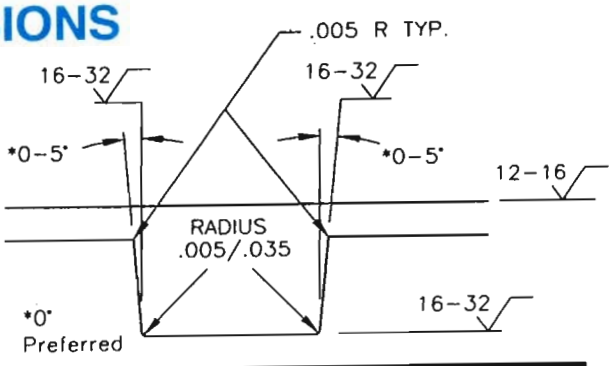
PISTON SEAL GLAND DIMENSIONS



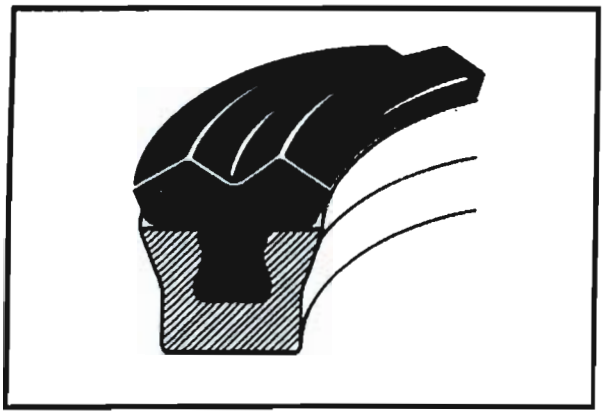


Std Dash No.	Radial Wall Cross/Sect.	"A" Bore Dia.	Tol.	"B" Groove Dia.	Tol.	"G" Groove Width Tol. (+.010/-.000) Narrow	Medium	Wide	"C"* Piston Dia.
006		.250		.138					.247
007		.281		.169					.278
008	1/16"	.312	+.001	.200	+.000				.309
009	(.073-	.344	-.000	.232	-.001	.094	.149	.207	.341
010	.067)	.375		.263					.372
011		.437		.325					.434
012		.500		.388					.497
110		.562		.384					.559
111		.625		.447					.622
112	3.32"	.687	+.002	.509	+.000				.684
113	(.106-	.750	-.000	.572	-.002	.141	.183	.245	.747
114	.100)	.812		.634					.809
115		.875		.697					.872
116		.937		.759					.934
210		1.000		.757					.997
211		1.063		.820					1.060
212		1.125		.882					1.122
213		1.188		.945					1.185
214		1.250		1.007					1.247
215	1/8"	1.313	+.002	1.070	+.000				1.310
216	(.143-	1.375	-.000	1.132	-.002	.188	.235	.304	1.372
217	.135)	1.438		1.195					1.435
218		1.500		1.257					1.497
219		1.563		1.320					1.560
220		1.625		1.382					1.622
221		1.688		1.445					1.685
222		1.750		1.507					1.747
325		1.875		1.503					1.872
326		2.000		1.628					1.997
327		2.125		1.753					2.122
328		2.250		1.878					2.247
329		2.375		2.003					2.372
330		2.500		2.128					2.497
331	3/16"	2.625	+.002	2.253	+.000	.281	.334	.424.	2.622
332	(.205-	2.750	-.000	2.378	-.002				2.747
333	.215)	2.875		2.503					2.872
334		3.000		2.628					2.997
335		3.125		2.753					3.122
336		3.250		2.878					3.247
337		3.375		3.003					3.372
338		3.500		3.128					3.497
339		3.625		3.253					3.622
340		3.750		3.378					3.747
341		3.875		3.503					3.872

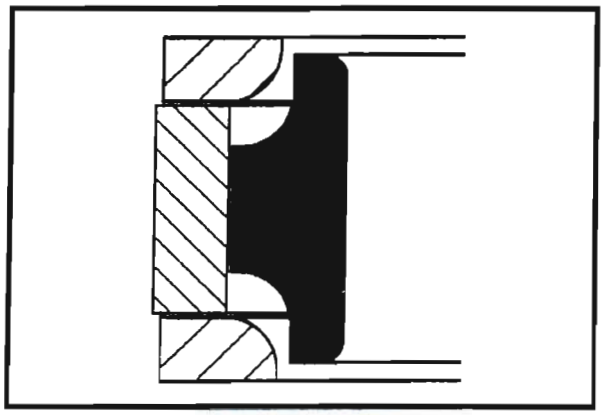
Std Dash No.	Radial Wall Cross/Sect.	"A" Bore Dia.	Tol.	"B" Groove Dia.	Tol.	"G" Groove Width Tol. (+.010/-.000) Narrow	Medium	Wide	"C"* Piston Dia.
342		4.000		3.628					3.997
343		4.125		3.753					4.122
344	3/16"	4.250	+.002	3.878	+.000				4.247
345	(.205-	4.375	-.000	4.003	-.002	.281	.334	.424	4.372
346	.215)	4.500		4.128					4.497
347		4.625		4.253					4.622
348		4.750		4.378					4.747
349		4.875		4.503					4.872
425		5.001		4.524					4.998
426		5.126		4.649					5.123
427		5.251		4.774					5.248
428		5.376		4.899					5.373
429		5.501		5.024					5.498
430		5.626		5.149					5.623
431		5.751		5.274					5.748
432		5.876		5.399					5.873
433		6.001		5.524					5.998
434		6.126	+.003	5.649					6.123
435		6.251	-.000	5.774					6.248
436		6.376		5.889					6.373
437		6.501		6.024					6.498
438		6.751		6.274					6.748
439		7.001		6.524					6.998
440		7.251		6.774					7.248
441		7.501		7.024					7.498
442	1/4"	7.751		7.274	+.000				7.748
443	(.269-	8.001		7.524	-.003	.375	.475	.579	7.998
444	.281)	8.251		7.774					8.248
445		8.501		8.024					8.498
446		9.001		8.524					8.998
447		9.501		9.024					9.498
448		10.001		9.524					9.998
449		10.501		10.024					10.498
450		11.001		10.524					10.998
451		11.501		11.024					11.498
452		12.001	+.004	11.524					11.998
453		12.501	-.000	12.024					12.498
454		13.001		12.524					12.998
455		13.501		13.024					13.498
456		14.001		13.524					13.998
457		14.501		14.024					14.498
458		15.001		14.524					14.998
459		15.501		15.024					15.498
460		16.001		15.524					15.998

*PISTON DIAMETER TOLERANCE IS + .002/ - .000

FOR SIZES NOT LISTED CONTACT H.P.S. TECHNICAL SERVICES



HYDRA-PACK™
MULTIPLE LIP U-CUPS



CAP-T™
HEAVY DUTY PISTON SEAL

HPS INC

Leaders in Seal Technology

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