

HPLC/UHPLC Pump Replacement Parts

Whether they are check valves, pistons or pump seals, all ASI replacement parts are designed to exceed the manufacturers specifications. All parts are subjected to rigorous engineering analysis and quality standards to insure the parts you purchase provide maximum life and superior chromatographic performance. Replacement parts are available for most HPLC/UHPLC pumps.

PrimeLine™ Replacement Part Features:

All check valves are self-priming, no external priming valve/syringe required

Designed to deliver superior flow stability and accuracy

Crush proof cartridge makes routine maintenance quick and easy

Pistons are engineered to insure a high quality surface finish

Seals are designed for long life, wide range of solvent compatibility, and optimum performance



Why ASI Check Valves are the Best

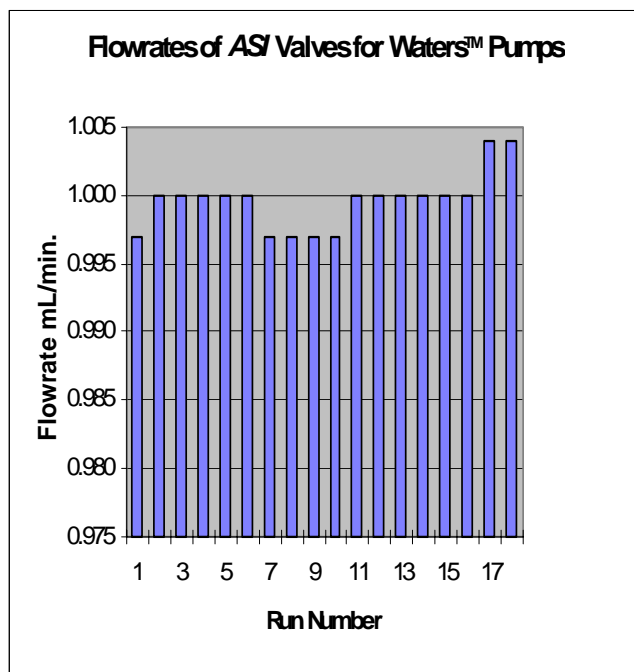
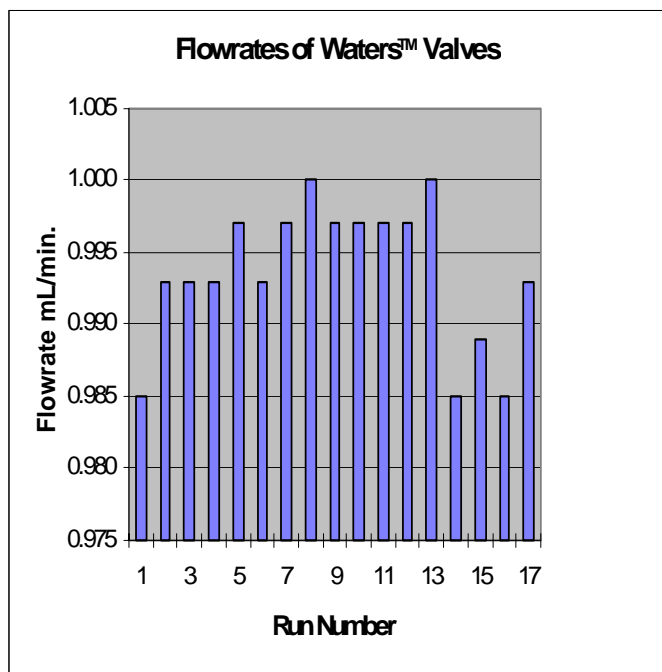
➤ Self-priming

With the ASI valve, priming is easy. Open the pump outlet to release backpressure on the pump, and turn on the pump. Your pump will prime itself, even if the head and intake lines are completely dry. You won't need to use syringes or draw-off valves to prime your pump.

➤ Superior Flow Rate Stability

Because of the rapid and repeatable closure rate of the valve, the ball returns to the seat and seals before solvents have a chance to flow back through the valve. The result is a flow rate that is extremely repeatable and accurate, which means more repeatable retention times.

Please see the following data.



Data Certified by: Baseline Services, Mercerville, NJ May 21, 1997, Bodman Chromatography Aston, PA May 21, 1997

➤ Acetonitrile-resistant valves

One of the headaches when using acetonitrile is the tendency for the ball and seat to get stuck - actually bonded - in the closed position. The frequency of this frustrating phenomenon depends on a number of factors, including the surface finish and condition of the ball and seat. The R & D team at ASI has developed a new check valve that will not bond shut in the presence of Acetonitrile even when immersed and unused for days or weeks at a time. We offer the same self-priming, rapid closure that ASI valves have always been known for.

Acetonitrile-resistant valves are now available for all Check Valve Cartridges that we currently offer including Waters, Agilent and other brands. Please simply add "ACN" at the end of the current P/Ns to order. Contact ASI for the more information.

➤ Rugged Construction

The valve will not crush, crack or leak due to high pressure. We designed the *ASI* cartridge so that loads are transmitted through the valve casing rather than through the seat, as in conventional valves. The result is a valve that can withstand up to a 10,000 PSI continuous operating pressure, and will never fail no matter how much you tighten the housing (go ahead and try it – it's guaranteed!). High pressure valves, up to 15,000 PSI, are also available.

➤ Pre-tested

100% *ASI* valves we ship must pass three stringent tests before it is shipped.

These tests are by far the most stringent in the HPLC industry, and indeed it is unlikely that any other valves would even pass these tests. But we do all these tests because we know how important it is to make sure that when you put a new valve in your pump, it will perform properly. After all, HPLC is hard enough as it is without worrying about your check valves!

1) Self-prime Test

This test uses a special pump test fixture that simulates an HPLC pump to verify that the valve is self-priming. After the test pump and intake line are purged of water, the valve must operate well enough so that the pump can draw water from a reservoir that is 36 inches below the pump intake. If the valve fails to prime, or “skips” even once during this test, it is rejected. This test not only guarantees that the valve will prime, but also that the valve will perform properly even at very low pressures, where most other valves do not work well.

2) High Pressure Leak Test

The valve is pressurized to 12,000 PSI and tested for leakage. Valves that exceed 50 nano liters per minute are rejected. This test not only insures valve integrity at very high pressures, but it also insures that the valve will still function properly even when the customer inadvertently over tightens the valve housing. We do not monitor nitrogen bubbles to measure leak rate, because a liquid can leak due to capillary action whereas gas will not. Besides, the chromatographer is pumping liquids, not gas!

3) Low Pressure Leak Test

The valve is pressurized to 500 PSI and tested for leakage. Valves that exceed 50 nano liters per minute are rejected. Most valves have difficulty closing and sealing properly in the absence of the large closing forces due to high pressure. *ASI* valves are designed so that they do not require any backpressure to operate properly, and this test verifies it.

➤ Convenient and Economical Cartridge Design

When it's time for routine maintenance, you only replace the cartridge, not the entire assembly. The *ASI* cartridge costs no more than most conventional valve rebuild kits, and you won't spend time chasing balls all over the lab bench.

Best Material of Piston Seals for Your Application

ASI offers both UHMW-PE and Teflon compounds for pump seal jackets. The selection of the best material depends on a number of factors, which are discussed below. In general we recommend using our UHMW-PE compound. It generates less wear material than Teflon, tends to act as a better bearing to help align the piston, and has a much longer service life than Teflon. Always inspect the piston for signs of scoring or wear when replacing seals. If your piston is worn or scratched- *replace it*- because nothing will destroy a seal faster than a worn or scratched piston. Refer to the section on pistons for advice on detecting a worn piston.

Piston Seal Installation

It is good practice to clean the pump head when replacing seals. Seal wear material will collect on the wetted surfaces of the head, and these will contaminate check valves and other downstream components. Always wet the seal and inside of the pump head with Isopropanol prior to installing the seal.

About ASI Pistons

It is hard to believe that sapphire, one of the hardest materials known to man, could ever be worn out or scratched by a soft material like Teflon or UHMW-PE. Unfortunately it does wear out. As the seal gets used, small particles of salt crystals, metal fragments, and other contaminants become embedded in the sealing surface of the seal. Over time these contaminants abrade the sapphire or ceramic plunger and form flat spots or longitudinal scratches. These wear spots will destroy any seal in a very short time.

It is extremely important to inspect the sapphire or ceramic plunger whenever you replace a seal. If there are any signs of scratches or glazed spots, replace the piston. Failure to do so will result in a shredded seal and a pump head full of seal wear material.

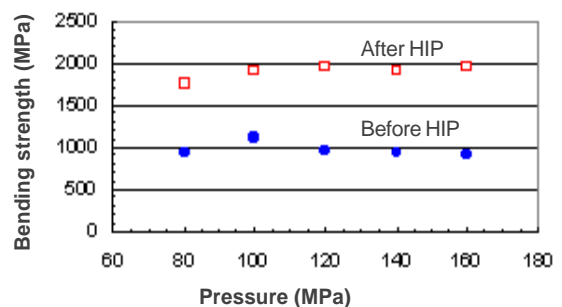
It is very difficult to see worn spots on a sapphire or ceramic piston. Hold the piston up to a bright light and inspect with a 10x magnifier or microscope. Any spot that appears dull, glazed, or scratched is a sure sign of a worn piston.

Our sapphire and ceramic rods are 100% inspected to ensure that there are no inclusions or other surface defects that may cause premature seal failure. We apply the same rigorous standards for quality control and close manufacturing tolerances that we maintain for our check valves.

Piston QC Tests and Instrumentation

Piston diameter	Digital micrometer
Piston length	Caliper
Geometry of ends	Shadowgraph 20X
Roundness	Talyrond
Surface finish	Talysurf
Groove (if any)	Shadowgraph 20X
Visual inspection	Binocular 25X

HIP Increases Density and Toughness



ASI Part No.	Description	OEM Reference
ABI/Kratos, Spectaflow 400, 1400A, 1406A		
200-1300	Piston Seal with Back-up Ring, UHMW, each	 7200-0088
200-1305	Piston Seal with Back-up Ring, UHMW, pk 10	
250-1420	Inlet Cartridge	
250-1420ACN	Acetonitrile-resistant, Inlet Cartridge	
250-1425	Outlet Cartridge	
250-1425ACN	Acetonitrile-resistant, Outlet Cartridge	
250-1430	Inlet Housing	
250-1435	Outlet Housing	
250-1440	Inlet Valve	 7200-0060
250-1440ACN	Acetonitrile-resistant, Inlet Valve	
250-1445	Outlet Valve	 7200-0062
250-1445ACN	Acetonitrile-resistant, Outlet Valve	
260-1220	Piston with Sapphire Rod	 1400-1970
Agilent, 1050, 1100, 1200 Analytical Pump		
200-1350	Piston Seal, UHMW, each	 0905-1420
200-1355	Piston Seal, UHMW, pkg 10	

ASI Part No.	Description		OEM Reference
200-1357	Piston Seal, Teflon, each		5063-6589
200-1358	Piston Seal, Teflon, pkg 10		
250-1396	Inlet Mechanical Cartridge		
250-1396ACN	Acetonitrile-resistant, Inlet Mechanical Cartridge		
250-1397	Outlet Cartridge (goes with ASI #250-1407)		
250-1397ACN	Acetonitrile-resistant, Outlet Cartridge (goes with ASI #250-1407)		
250-1407	Outlet Housing		
250-1408	Inlet Mechanical Housing		
250-1409	Inlet Mechanical Valve		
250-1409ACN	Acetonitrile-resistant, Inlet Mechanical Valve		
250-1417	Outlet Valve		01018-60008
250-1417ACN	Acetonitrile-resistant, Outlet Valve		
250-1418	Outlet Cartridge		
250-1418ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1495	Outlet Housing		
250-1496	Outlet Valve		G1312-60067
250-1496ACN	Acetonitrile-resistant, Outlet Valve		

ASI Part No.	Description		OEM Reference
250-2300	Inlet AIV Cartridge, Direct Replacement		G1312-60020
260-1330	Piston with Sapphire Rod		5063-6586
Agilent, 1090			
200-1367	Piston Seal, Teflon, each		5062-2494
200-1368	Piston Seal, Teflon, pkg 10		
250-1390	Inlet Cartridge		
250-1390ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1395	Outlet Cartridge		
250-1395ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1400	Inlet Housing		
250-1405	Outlet Housing		
250-1410	Inlet Valve		79835-25211 & 79835-67101
250-1410ACN	Acetonitrile-resistant, Inlet Valve		
250-1415	Outlet Valve		79385-25211 & 79835-67101
250-1415ACN	Acetonitrile-resistant, Outlet Valve		
260-1340	Piston with Sapphire Rod		3980-0672






ASI Part No.	Description		OEM Reference
Alcott, 760, 765			
250-1930	Inlet Cartridge		
250-1930ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1935	Outlet Cartridge		
250-1935ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1940	Inlet Housing		
250-1945	Outlet Housing		
250-1950	Inlet Valve		2200-0220
250-1950ACN	Acetonitrile-resistant, Inlet Valve		
250-1955	Outlet Valve		2200-0230
250-1955ACN	Acetonitrile-resistant, Outlet Valve		
ASI, Model 500 Micro Head			
A500-1009-U-2	Piston Seal Assembly, UHMW, pk 2		
A500-1009-U-10	Piston Seal Assembly, UHMW, pk 10		
A500-1023-02	Wash Seal Assembly, UHMW, pk 2		
A500-1023-10	Wash Seal Assembly, UHMW, pk 10		
A500-1133	In/Outlet Cartridge, Direct Replacement		
A500-1133ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement		

ASI Part No.	Description	OEM Reference	
500-1131	Inlet Housing		
500-1132	Outlet Housing		
A500-1134	Inlet Valve		
A500-1134ACN	Acetonitrile-resistant, Inlet Valve		
A500-1128	Outlet Valve		
A500-1128ACN	Acetonitrile-resistant, Outlet Valve		
A500-1180	In/Outlet Check Valve Filter Assembly		
A500-1117	Piston with Ceramic Rod		
ASI, Model 500 Analytical Head			
A500-1006-U-2	Piston Seal Assembly, UHMW, pk 2		
A500-1006-U-10	Piston Seal Assembly, UHMW, pk 10		
A500-1005-02	Wash Seal Assembly, UHMW, pk 2		
A500-1005-10	Wash Seal Assembly, UHMW, pk 10		
A500-1050	In/Outlet Cartridge		
A500-1050ACN	Acetonitrile-resistant, In/Outlet Cartridge		
500-1167	Inlet Housing		

ASI Part No.	Description		OEM Reference
500-1196	Outlet Housing		
A500-1052	Inlet Valve		
A500-1052ACN	Acetonitrile-resistant, Inlet Valve		
A500-1054	Outlet Valve		
A500-1054ACN	Acetonitrile-resistant, Outlet Valve		
A500-1182	Inlet Check Valve Filter Assembly		
A500-1116	Piston with Sapphire Rod		
ASI, Model 500 Semi-Prep Head			
A500-1026-U-2	Piston Seal Assembly, UHMW, pk 2		
A500-1026-U-10	Piston Seal Assembly, UHMW, pk 10		
A500-1045-02	Wash Seal Assembly, UHMW, pk 2		
A500-1045-10	Wash Seal Assembly, UHMW, pk 10		
A500-1060	Inlet Cartridge		
A500-1060ACN	Acetonitrile-resistant, Inlet Cartridge		
A500-1070	Outlet Cartridge (Acetonitrile-resistant)		
500-1910	Inlet Housing		

ASI Part No.	Description		OEM Reference
500-1196	Outlet Housing		
A500-1062	Inlet Valve		
A500-1062ACN	Acetonitrile-resistant, Inlet Valve		
A500-1072	Outlet Valve (Acetonitrile-resistant)		
A500-1024	Piston with Sapphire Rod		
ASI, Model 500 Prep Head			
A500-1046-T-2	Piston Seal Assembly, Teflon, pk 2		
A500-1046-T-10	Piston Seal Assembly, Teflon, pk 10		
A500-1048-02	Wash Seal Assembly, Teflon, pk 2		
A500-1048-10	Wash Seal Assembly, Teflon, pk 10		
A500-1060	Inlet Cartridge		
A500-1060ACN	Acetonitrile-resistant, Inlet Cartridge		
A500-1070	Outlet Cartridge (Acetonitrile-resistant)		
500-1911	Inlet Housing		
500-1196	Outlet Housing		

ASI Part No.	Description		OEM Reference
A500-1063	Inlet Valve		
A500-1063ACN	Acetonitrile-resistant, Inlet Valve		
A500-1072	Outlet Valve (Acetonitrile-resistant)		
A500-1044	Piston with Ceramic Rod		
ASI, Model 520 Micro Head			
A500-1009-U-2	Piston Seal Assembly, UHMW, pk 2		
A500-1009-U-10	Piston Seal Assembly, UHMW, pk 10		
A500-1023-02	Wash Seal Assembly, UHMW, pk 2		
A500-1023-10	Wash Seal Assembly, UHMW, pk 10		
522-1975	In/Outlet Cartridge, Direct Replacement		
522-1975ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement		
522-1051	Inlet Housing		
522-1052	Outlet Housing		
522-1064	Inlet Valve		
522-1064ACN	Acetonitrile-resistant, Inlet Valve		

ASI Part No.	Description	OEM Reference
522-1065	Outlet Valve	
522-1065ACN	Acetonitrile-resistant, Outlet Valve	
522-1033	Piston with Ceramic Rod	
ASI, Model 520 Analytical Head		
522-1129-2	Piston Seal, Wash Seal Assembly, UHMW, pk 2	
522-1129-10	Piston Seal, Wash Seal Assembly, UHMW, pk 10	
522-1975	In/Outlet Cartridge, Direct Replacement	
522-1975ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement	
522-1051	Intlet Housing	
522-1052	Outlet Housing	
522-1064	Inlet Valve	
522-1064ACN	Acetonitrile-resistant, Inlet Valve	
522-1065	Outlet Valve	
522-1065ACN	Acetonitrile-resistant, Outlet Valve	
522-1034	Piston with Sapphire Rod	
ASI, Model 520 Semi-Prep Head		

ASI Part No.	Description		OEM Reference
522-1130-2	Piston Seal, Wash Seal Assembly, UHMW, pk 2		
522-1130-10	Piston Seal, Wash Seal Assembly, UHMW, pk 10		
A500-1060	Inlet Cartridge		
A500-1060ACN	Acetonitrile-resistant, Inlet Cartridge		
A500-1050	Outlet Cartridge		
A500-1050ACN	Acetonitrile-resistant, In/Outlet Cartridge		
500-1910	Inlet Housing		
500-1196	Outlet Housing		
A500-1062	Inlet Valve		
A500-1062ACN	Acetonitrile-resistant, Inlet Valve		
A500-1054	Outlet Valve		
A500-1054ACN	Acetonitrile-resistant, Outlet Valve		
522-1035	Piston with Sapphire Rod		
ASI, Model 520 Prep Head			
522-1205-2	Piston Seal, Wash Seal Assembly, Teflon, pk 2		
522-1205-10	Piston Seal, Wash Seal Assembly, Teflon, pk 10		

ASI Part No.	Description		OEM Reference
A500-1060	In/Outlet Cartridge		
A500-1060ACN	Acetonitrile-resistant, In/Outlet Cartridge		
500-1911-1	Inlet Housing		
500-1196-2	Outlet Housing		
522-1067	Inlet Valve		
522-1067ACN	Acetonitrile-resistant, Inlet Valve		
522-1066	Outlet Valve		
522-1066ACN	Acetonitrile-resistant, Outlet Valve		
522-1036	Piston with Ceramic Rod		
Beckman, 100A, 110A, 110B			
200-1240	Piston Seal, UHMW, each		887138
200-1241	Piston Seal, UHMW, pk 10		
200-1245	Piston Seal Insertion Tool		
260-1140	Piston only, with Sapphire Rod		243053
Beckman, 114, 114M, 116, 118, 125, 126, 127, 128,			

ASI Part No.	Description		OEM Reference
200-1250	Piston Seal, High Pressure, UHMW, each		237162
200-1251	Piston Seal, High Pressure, UHMW, pk 10		
260-1145	Piston only, with Sapphire Rod		240714
Beckman, 112, 112M			
200-1255	Piston Seal, UHMW, each		236797
200-1256	Piston Seal, UHMW, pk 10		
260-1140	Piston only, with Sapphire Rod		243053
Beckman, 100A, 110A, 110B, 112, 112M , 114, 114M, 116, 118, 125, 126, 127, 128,			
250-1240	Inlet Cartridge		
250-1240ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1245	Outlet Cartridge		
250-1245ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1250	Inlet Housing		
250-1255	Outlet Housing		
250-1260	Inlet Valve		240720
250-1260ACN	Acetonitrile-resistant, Inlet Valve		

ASI Part No.	Description		OEM Reference
250-1265	Outlet Valve		240721
250-1265ACN	Acetonitrile-resistant, Outlet Valve		
Bio-Rad, 1330, 1350			
200-1230	Piston Seal, UHMW, each		125-0302
200-1231	Piston Seal, UHMW, pk 10		
250-1150	Inlet Cartridge		
250-1150ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1155	Outlet Cartridge		
250-1155ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1160	Inlet Housing		
250-1165	Outlet Housing		
250-1170	Inlet Valve		125-0305
250-1170ACN	Acetonitrile-resistant, Inlet Valve		
250-1175	Outlet Valve		125-0307
250-1175ACN	Acetonitrile-resistant, Outlet Valve		
260-1130	Piston with Sapphire Rod		125-0304
Bischoff, 2200, 2250			

ASI Part No.	Description		OEM Reference
250-1930	Inlet Cartridge		
250-1930ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1935	Outlet Cartridge		
250-1935ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1940	Inlet Housing		
250-1945	Outlet Housing		
250-1950	Inlet Valve		2200-0220
250-1950ACN	Acetonitrile-resistant, Inlet Valve		
250-1955	Outlet Valve		2200-0230
250-1955ACN	Acetonitrile-resistant, Outlet Valve		
Chrompack, CP 5000			
200-1210	Piston Seal, UHMW, each		A2962-010 & A3070-010
200-1215	Piston Seal, UHMW, pk 10		
200-1211	Piston Seal, Teflon, each		A2962-010 & A3070-010
200-1212	Piston Seal, Teflon, pk 10		
200-1218	Flush Seal, UHMW, each		A2963-010
200-1219	Flush Seal, UHMW, pk 10		

ASI Part No.	Description		OEM Reference
250-1190	Inlet Cartridge		
250-1190ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1197	Transducer Cartridge		
250-1197ACN	Acetonitrile-resistant, Transducer Cartridge		
250-1200	Inlet Housing		
250-1207	Transducer Housing		
250-1210	Inlet Valve		A3495-010
250-1210ACN	Acetonitrile-resistant, Inlet Valve		
250-1217	Transducer Valve		A3990-010
250-1217ACN	Acetonitrile-resistant, Transducer Valve		
260-1100	Piston with Sapphire Rod		A3102-010
Dionex, P-580, P-680			
200-1300	Piston Seal with Back-up Ring, UHMW, each		7200-0088
200-1305	Piston Seal with Back-up Ring, UHMW, pk 10		
250-1420	Inlet Cartridge		
250-1420ACN	Acetonitrile-resistant, Inlet Cartridge		

ASI Part No.	Description		OEM Reference
250-1425	Outlet Cartridge		
250-1425ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1430	Inlet Housing		
250-1435	Outlet Housing		
250-1440	Inlet Valve		7200-0060
250-1440ACN	Acetonitrile-resistant, Inlet Valve		
250-1445	Outlet Valve		7200-0062
250-1445ACN	Acetonitrile-resistant, Outlet Valve		
Dionex, GP 50/IP25 Standard Bore			
200-1306	Piston Seal with O-ring FFKM installed, UHMW, each		54400
200-1307	Piston Seal with O-ring FFKM installed, UHMW, pk 10		
Dionex, GP-40			
250-1412	In/Outlet Cartridge, Direct Replacement PEEK		47747
250-1422	Inlet Housing, Black PEEK, Direct Replacement		
250-1427	Outlet Housing, Black PEEK, Direct Replacement		

ASI Part No.	Description		OEM Reference
250-1432	Inlet Valve, Direct Replacement PEEK		47660
250-1437	Outlet Valve, Direct Replacement PEEK		47661
Dionex, ICS 900, 1000, 1100, 1500, 1600, 2000, 3000			
250-1421	In/Outlet Cartridge, Direct Replacement		45994
250-1431	Inlet Housing, Black PEEK, Direct Replacement		
250-1436	Outlet Housing, Black PEEK, Direct Replacement		
250-1441	Inlet Valve, Direct Replacement PEEK		45722
250-1446	Outlet Valve, Direct Replacement PEEK		45721
Eldex, A, AA, B, E			
200-1260	Piston Seal with Back-up Ring, UHMW, each		1180 & 1181
200-1261	Piston Seal with Back-up Ring, UHMW, pkg 10		
250-1310	Inlet Cartridge		
250-1310ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1315	Outlet Cartridge		
250-1315ACN	Acetonitrile-resistant, Outlet Cartridge		

ASI Part No.	Description		OEM Reference
250-1320	Inlet Housing		
250-1325	Outlet Housing		
250-1330	Inlet Valve		1371
250-1330ACN	Acetonitrile-resistant, Inlet Valve		
250-1335	Outlet Valve		1372
250-1335ACN	Acetonitrile-resistant, Outlet Valve		
260-1160	Piston with Sapphire Rod		5201
ESA, 580, 582			
200-1410	Piston Seal, UHMW, each		
200-1415	Piston Seal, UHMW, pkg 10		
200-1420	Piston Seal, Teflon, each		
200-1425	Piston Seal, Teflon, pkg 10		
260-1303	Piston Only with Sapphire Rod		
Gilson/Rainin, 5SC, 5SS, 5TI			
200-1225	Piston Seal, UHMW, each		5463088863 & R007101633 / 34
200-1226	Piston Seal, UHMW, pk 10		

ASI Part No.	Description		OEM Reference
260-1195	Piston with Sapphire Rod (only for 5TI)		3650008 & R007101657
Gilson/Rainin, 10SC, 10SS, 10TI			
200-1220	Piston Seal, UHMW, each		5463125895 & R00710636 / 37
200-1221	Piston Seal, UHMW, pk 10		
260-1190	Piston with Sapphire Rod (only for 10TI)		3650009 & R007101658
Gilson/Rainin, 5SC, 5SS, 5WSS, 10SC, 10SS, 10WSS			
250-1360	Inlet Cartridge		
250-1360ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1365	Outlet Cartridge		
250-1365ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1370	Inlet Housing		
250-1375	Outlet Housing		
250-1380	Inlet Valve		3645242 & E50131 & R00710616
250-1380ACN	Acetonitrile-resistant, Inlet Valve		
250-1385	Outlet Valve		3645245 & E50121 & R00710617
250-1385ACN	Acetonitrile-resistant, Outlet Valve		
Gilson/Rainin, 25SC, 25SS, 25WSS			

ASI Part No.	Description		OEM Reference
200-1222	Piston Seal, UHMW, each (only for 25SC, 25SS)		5463050825 & R007101643
200-1223	Piston Seal, UHMW, pk 10		
250-1361	Inlet Cartridge		
250-1361ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1366	Outlet Cartridge		
250-1366ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1371	Inlet Housing		
250-1376	Outlet Housing		
250-1381	Inlet Valve		3645242 & E50131 & R00710616
250-1381ACN	Acetonitrile-resistant, Inlet Valve		
250-1386	Outlet Valve		3645245 & E50121 & R00710617
250-1386ACN	Acetonitrile-resistant, Outlet Valve		
Hitachi, 655, L6000, L6200, L6200A, L7100			
200-1290	Piston Seal, UHMW, each		655-1080
200-1295	Piston Seal, UHMW, pk 10		
200-1297	Piston Seal, Teflon, each		655-1080
200-1298	Piston Seal, Teflon, pk 10		

ASI Part No.	Description		OEM Reference
200-1291	Piston Seal Insertion Tool		
260-1230	Piston with Sapphire Rod		ANO-2328
260-1230C	Piston with Ceramic Rod		ANO-2328
Hitachi, 655, L6000, L6200, L6200A			
250-1690	Inlet Cartridge		
250-1690ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1695	Outlet Cartridge		
250-1695ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1700	Inlet Housing		
250-1705	Outlet Housing		
250-1710	Inlet Valve		885-1330
250-1710ACN	Acetonitrile-resistant, Inlet Valve		
250-1715	Outlet Valve		885-1331
250-1715ACN	Acetonitrile-resistant, Outlet Valve		
Hitachi, L7100			

ASI Part No.	Description		OEM Reference
250-1660	Inlet Cartridge		
250-1660ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1665	Outlet Cartridge		
250-1665ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1670	Inlet Housing		
250-1675	Outlet Housing		
250-1680	Inlet Valve		AN0-0836
250-1680ACN	Acetonitrile-resistant, Inlet Valve		
250-1685	Outlet Valve		AN0-0837
250-1685ACN	Acetonitrile-resistant, Outlet Valve		
Hitachi, L-2100, L-2130			
250-1073	In/Outlet Cartridge		48901327
250-1073ACN	Acetonitrile-resistant, In/Outlet Cartridge		
250-1083	Inlet Housing		
250-1088	Outlet Housing		
250-1093	Inlet Valve		38901205
250-1093ACN	Acetonitrile-resistant, Inlet Valve		











ASI Part No.	Description		OEM Reference
250-1098	Outlet Valve		38901206
250-1098ACN	Acetonitrile-resistant, Outlet Valve		
Jasco, BIP-1, PU-880, PU-980, PU-1580			
200-0170	Piston Seal, UHMW, each		6560-H148A
200-0175	Piston Seal, UHMW, pk 10		
200-0171	Piston Seal, Teflon, each		6560-H148A
200-0176	Piston Seal, Teflon, pk 10		
200-0177	Piston Seal Insertion Tool		
260-0170	Piston with Sapphire Rod		2305-0009A
Jasco, PU-880, PU-980			
250-0100	Inlet Cartridge		
250-0100ACN	Acetonitrile-resistant, Inlet Cartridge		
250-0105	Outlet Cartridge		
250-0105ACN	Acetonitrile-resistant, Outlet Cartridge		
250-0110	Inlet Housing		
250-0115	Outlet Housing		

ASI Part No.	Description		OEM Reference
250-0120	Inlet Valve		6688-H404A
250-0120ACN	Acetonitrile-resistant, Inlet Valve		
250-0125	Outlet Valve		6688-H405A
250-0125ACN	Acetonitrile-resistant, Outlet Valve		
Jasco, PU-1580			
250-0101	Inlet Cartridge		
250-0101ACN	Acetonitrile-resistant, Inlet Cartridge		
250-0106	Outlet Cartridge		
250-0106ACN	Acetonitrile-resistant, Outlet Cartridge		
250-0111	Inlet Housing		
250-0116	Outlet Housing		
250-0121	Inlet Valve		6778-H109A
250-0121ACN	Acetonitrile-resistant, Inlet Valve		
250-0126	Outlet Valve		6778-H110A
250-0126ACN	Acetonitrile-resistant, Outlet Valve		
Jasco, BIP-1			
250-0130	Inlet Cartridge		
250-0130ACN	Acetonitrile-resistant, Inlet Cartridge		

ASI Part No.	Description		OEM Reference
250-0135	Outlet Cartridge		
250-0135ACN	Acetonitrile-resistant, Outlet Cartridge		
250-0140	Inlet Housing		
250-0145	Outlet Housing		
250-0150	Inlet Valve		6260-H101A
250-0150ACN	Acetonitrile-resistant, Inlet Valve		
250-0155	Outlet Valve		6260-H102A
250-0155ACN	Acetonitrile-resistant, Outlet Valve		
Knauer, K-100, K-120, K-500, K-501, K-1000, K-1001			
200-0180	Piston Seal, Teflon, each		
200-0185	Piston Seal, Teflon, pk 10		
200-0181	Wash Seal, Teflon, each		
200-0186	Wash Seal, Teflon, pk 10		
200-0182	Replacement Kit contains 2 Teflon Piston Seals, 2 Wash Seals, 2 O-rings		A1514
250-0260	In/Outlet Cartridge, Direct Replacement		A0684
250-0260ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement		
Lab Alliance, Prep 24, 100			

ASI Part No.	Description		OEM Reference
250-1723	Inlet Cartridge		
250-1723ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1728	Outlet Cartridge		
250-1728ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1733	Inlet Housing		
250-1738	Outlet Housing		
250-1743	Inlet Valve		
250-1743ACN	Acetonitrile-resistant, Inlet Valve		
250-1748	Outlet Valve		
250-1748ACN	Acetonitrile-resistant, Outlet Valve		
LDC/Milton Roy, Analytical			
200-1280	Piston Seal, UHMW, each		206234
200-1285	Piston Seal, UHMW, pk 10		
200-1281	Piston Seal, Teflon, each		206234
200-1286	Piston Seal, Teflon, pk 10		
200-1287	Replacement Kit contains UHMW Piston Seal, Back-up Washer, O-ring, 2 Bushings		801892001
200-1288	Replacement Kit contains Teflon Piston Seal, Back-up Washer, O-ring, 2 Bushings		801892001

ASI Part No.	Description		OEM Reference
250-1280	Inlet Cartridge		
250-1280ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1285	Outlet Cartridge		
250-1285ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1290	Inlet Housing		
250-1295	Outlet Housing		
250-1300	Inlet Valve		900947001
250-1300ACN	Acetonitrile-resistant, Inlet Valve		
250-1305	Outlet Valve with Adapter Seal		900947002
250-1305ACN	Acetonitrile-resistant, Outlet Valve with Adapter Seal		
250-1307-5	Adapter Seal, pk 5		
260-1180	Piston with Sapphire Rod		
LKB, 2150			
200-1330	Piston Seal with Back-up Ring, UHMW, each		
200-1335	Piston Seal with Back-up Ring, UHMW, pk 10		

ASI Part No.	Description		OEM Reference
250-1840	Inlet Cartridge		
250-1840ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1845	Outlet Cartridge		
250-1845ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1850	Inlet Housing		
250-1855	Outlet Housing		
250-1860	Inlet Valve		
250-1860ACN	Acetonitrile-resistant, Inlet Valve		
250-1865	Outlet Valve		
250-1865ACN	Acetonitrile-resistant, Outlet Valve		
260-1185	Piston with Sapphire Rod		
Perkin-Elmer, Series 1, 2, 3, 3B, 4, 10, 200, 400, 410, 620, Model 250, Integral 4000			
200-1510	High Pressure Piston Seal Kit contains Teflon Piston Seal, Clear UHMW Back-up Ring, Teflon Busing, Back-up O-rings		0990-7331
200-1512	High Pressure Piston Seal Kit contains UHMW Piston Seal, Clear UHMW Back-up Ring, Teflon Busing, Back-up O-rings		0990-7324
200-1530	Wash Seal, UHMW, each (only for Series 10)		
200-1535	Wash Seal, UHMW, pk 10		

ASI Part No.	Description		OEM Reference
260-1800	Piston Self-flush with Sapphire Rod (only for Series 10)		0254-2442
Perkin-Elmer, Series 4, 200, 400, 410, 620, Model 250, Integral 4000			
200-1520	Low Pressure Piston Seal, Teflon, each		0990-7330
200-1525	Low Pressure Piston Seal, Teflon, pk 10		
200-1521	Low Pressure Piston Guide		0254-2313
250-1780	Inlet Cartridge		
250-1780ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1785	Outlet Cartridge		
250-1785ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1790	Inlet Housing		
250-1795	Outlet Housing		
250-1800	Inlet Valve		0254-0177
250-1800ACN	Acetonitrile-resistant, Inlet Valve		
250-1805	Outlet Valve		0254-0197
250-1805ACN	Acetonitrile-resistant, Outlet Valve		
260-1830	High Pressure Piston with Sapphire Rod comes with Cam Follower Bearing and 2 Yoke Bushings (Only units built after 12/89 for Series 400, 410, 620)		N260-0124

ASI Part No.	Description		OEM Reference
260-1840	Low Pressure Piston with Sapphire Rod (Only units built after 12/89 for Series 400, 410, 620)		N260-0104
Perkin-Elmer, Series 1, 2, 3, 3B, 10			
250-1810	Inlet Cartridge		
250-1810ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1815	Outlet Cartridge		
250-1815ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1820	Inlet Housing		
250-1825	Outlet Housing		
250-1830	Inlet Valve		0254-0546
250-1830ACN	Acetonitrile-resistant, Inlet Valve		
250-1835	Outlet Valve		0254-0547
250-1835ACN	Acetonitrile-resistant, Outlet Valve		
Shimadzu, LC-2010			
200-1420	Piston Seal, Teflon, each		228-35146-00
200-1425	Piston Seal, Teflon, pk 10		
200-1432	Metering Pump Seal, Teflon, each		228-35145 & 228-35145-00 & 228-35145-84
200-1437	Metering Pump Seal, Teflon, pk 10		

ASI Part No.	Description		OEM Reference
250-1493	DIV In/Outlet Cartridge		228-37149-92
250-1493ACN	Acetonitrile-resistant, DIV Outlet Cartridge		
250-1502	Outlet Housing		
250-1510	Outlet Valve		228-37147-93
250-1510ACN	Acetonitrile-resistant, Outlet Valve		
260-1303	Piston only with Sapphire Rod		228-35281-91 & 228-35601-93
Shimadzu, LC-20AB, LC-20AD, LC-10ADVP, LC-20ADXR			
200-1410	Piston Seal, UHMW, each		228-32628-91
200-1415	Piston Seal, UHMW, pk 10		
200-1420	Piston Seal, Teflon, each (not for LC-20ADXR)		228-18745-00
200-1425	Piston Seal, Teflon, pk 10		
250-1492	In/Outlet Cartridge		
250-1492ACN	Acetonitrile-resistant, In/Outlet Cartridge		
250-1471	Inlet Housing		
250-1506	Inlet Housing, 2 Piece Style (not for LC-10ADVP)		
250-1476	Outlet Housing		

ASI Part No.	Description		OEM Reference
250-1490	Outlet Housing, 2 Piece Style (not for LC-10ADVP)		
250-1500	Inlet Valve		228-48249-91
250-1500ACN	Acetonitrile-resistant, Inlet Valve		
250-1507	Inlet Valve with 2 Piece Style Housing (not for LC-10ADVP)		228-48249-91
250-1507ACN	Acetonitrile-resistant, Inlet Valve		
250-1505	Outlet Valve		228-45705-91
250-1505ACN	Acetonitrile-resistant, Outlet Valve		
250-1491	Outlet Valve with 2 Piece Style Housing (not for LC-10ADVP)		228-45705-91
250-1491ACN	Acetonitrile-resistant, Outlet Valve		
260-1303	Piston only with Sapphire Rod		228-35281-95 & 228-35601-93
Shimadzu, LC-6A, LC-6AD			
200-1440	Piston Seal, Teflon, each		228-11999 & 228-11999-00
200-1445	Piston Seal, Teflon, pk 10		
200-1441	Piston Seal Insertion Tool		
260-1310	Piston with Sapphire Rod (only for LC-6A)		228-12904-93
Shimadzu, LC-6A, LC-6AD, LC-7A, LC-8A, LC-10AS			

ASI Part No.	Description		OEM Reference
250-1467	Outlet Cartridge		
250-1467ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1477	Outlet Housing		
250-1487	Outlet Valve		228-09054-93 & 228-09054-94
250-1487ACN	Acetonitrile-resistant, Outlet Valve		
250-1512	Inlet Valve (only for LC-8A)		228-20256-91
250-1512ACN	Acetonitrile-resistant, Inlet Valve		
Shimadzu, LC-6A, LC-10AS			
250-1462	Inlet Cartridge		
250-1462ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1472	Inlet Housing		
250-1482	Inlet Valve		228-12353-91
250-1482ACN	Acetonitrile-resistant, Inlet Valve		
Shimadzu, LC-6AD, LC-7A, LC-10AS			
200-1430	Metering Pump Piston Seal, UHMW, each		228-21975-91 & 228-21975-00 & 228-21975-84
200-1435	Metering Pump Piston Seal, UHMW, pk 10		
200-1432	Metering Pump Piston Seal, Teflon, each		228-35145-00 & 228-35145-84
200-1437	Metering Pump Piston Seal, Teflon, pk 10		

ASI Part No.	Description		OEM Reference
200-1431	Wash Seal, UHMW, each (not for LC-6AD)		228-28499-00
200-1436	Wash Seal, UHMW, pk 10		
260-1305	Piston with Sapphire Rod (not for LC-6AD)		228-17019-91
Shimadzu, LC-10AD, LC-600, LC-9A			
200-1410	Piston Seal, UHMW, each		228-32628-91
200-1415	Piston Seal, UHMW, pk 10		
200-1420	Piston Seal, Teflon, each		228-18745-00
200-1425	Piston Seal, Teflon, pk 10		
250-1457	Inlet Valve	 <small>3D Image</small>	228-33492-91
250-1457ACN	Acetonitrile-resistant, Inlet Valve		
250-1492	Outlet Cartridge		
250-1492ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1476	Outlet Housing		
250-1505	Outlet Valve		228-45705-91
250-1505ACN	Acetonitrile-resistant, Outlet Valve		
250-1460	Inlet Cartridge, Discontinued by Shimadzu		
250-1460ACN	Acetonitrile-resistant, Inlet Cartridge		

ASI Part No.	Description		OEM Reference
250-1465	Outlet Cartridge, Discontinued by Shimadzu		
250-1465ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1470	Inlet Housing, Discontinued by Shimadzu		
250-1475	Outlet Housing, Discontinued by Shimadzu		
250-1480	Inlet Valve, Discontinued by Shimadzu		228-18522-91
250-1480ACN	Acetonitrile-resistant, Inlet Valve		
250-1485	Outlet Valve, Discontinued by Shimadzu		228-18522-92
250-1485ACN	Acetonitrile-resistant, Outlet Valve		
260-1320	Piston with Sapphire Rod (not for LC-9A)		228-18523-92
Shimadzu, LC-10ATVP			
200-1430	Piston Seal, UHMW, each		228-21975-91 & 228-21975-00 & 228-21975-84
200-1435	Piston Seal, UHMW, pk 10		
200-1432	Piston Seal, Teflon, each		228-35145 & 228-35145-00 & 228-35145-84
200-1437	Piston Seal, Teflon, pk 10		
200-1431	Wash Seal, UHMW, each		228-28499-00
200-1436	Wash Seal, UHMW, pk 10		

ASI Part No.	Description		OEM Reference
250-1464	Inlet Cartridge		
250-1464ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1492	Outlet Cartridge		
250-1492ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1474	Inlet Housing		
250-1476	Outlet Housing		
250-1484	Inlet Valve		228-32166-91
250-1484ACN	Acetonitrile-resistant, Inlet Valve		
250-1505	Outlet Valve		228-45705-91
250-1505ACN	Acetonitrile-resistant, Outlet Valve		
260-1302	Piston with Sapphire Rod		228-35009-93 & 228-35009-92 (ZR)
Shimadzu, LC-20AT			
200-1432	Piston Seal, Teflon, each		228-35145 & 228-35145-00 & 228-35145-84
200-1437	Piston Seal, Teflon, pk 10		
250-1464	Inlet Cartridge (Primary inlet)		
250-1464ACN	Acetonitrile-resistant, Inlet Cartridge (Primary)		










ASI Part No.	Description		OEM Reference
250-1492	Inlet Cartridge (Secondary inlet)		
250-1492ACN	Acetonitrile-resistant, Inlet Cartridge (Secondary)		
250-1474	Inlet Housing (Primary inlet)		
250-1471	Inlet Housing (Secondary inlet)		
250-1484	Inlet Valve (Primary inlet)		228-45704-92
250-1484ACN	Acetonitrile-resistant, Inlet Valve (Primary)		
250-1500	Inlet Valve (Secondary inlet)		228-48249-91
250-1500ACN	Acetonitrile-resistant, Inlet Valve (Secondary)		
260-1302	Piston with Sapphire Rod		228-35009-93 & 228-35009-92 (ZR)
Shimadzu, LC-10AT			
200-1430	Piston Seal, UHMW, each		228-21975-91 & 228-21975-00 & 228-21975-84
200-1435	Piston Seal, UHMW, pk 10		
200-1432	Metering Pump Piston Seal, Teflon, each		228-35145 & 228-35145-00 & 228-35145-84
200-1437	Metering Pump Piston Seal, Teflon, pk 10		
200-1431	Wash Seal, UHMW, each		228-28499-00
200-1436	Wash Seal, UHMW, pk 10		

ASI Part No.	Description		OEM Reference
250-1464	Inlet Cartridge		
250-1464ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1492	Outlet Cartridge		
250-1492ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1465	Outlet Cartridge, Discontinued by Shimadzu		
250-1465ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1474	Inlet Housing		
250-1476	Outlet Housing		
250-1475	Outlet Housing, Discontinued by Shimadzu		
250-1484	Inlet Valve		228-32166-91
250-1484ACN	Acetonitrile-resistant, Inlet Valve		
250-1505	Outlet Valve		228-45705-91
250-1505ACN	Acetonitrile-resistant, Outlet Valve		
250-1485	Outlet Valve, Discontinued by Shimadzu		228-18522-92
250-1485ACN	Acetonitrile-resistant, Outlet Valve		
SSI, Accuflow Series 2, 3, 4			

ASI Part No.	Description		OEM Reference
200-1336	Wash Seal, Teflon, each		
200-1337	Wash Seal, Teflon, pk 10		
200-1338	Piston Seal, High Pressure, Teflon, each		
200-1339	Piston Seal, High Pressure, Teflon, pk 10		
200-1341	Replacement Kit contains: UHMW Piston Seal, Piston Seal Back-up Ring, UHMW Wash Seal, Wash Seal Back-up Ring, O-ring		120680
200-1342	Piston Seal, UHMW, each		901168
200-1343	Piston Seal, UHMW, pk 10		
200-1346	Wash Seal, UHMW, each		902029
200-1347	Wash Seal, UHMW, pk 10		
260-1210	Piston with Sapphire Rod		12-1486
SSI, Accuflow Series 1, 2, 3, 4 SS			
250-1750	Inlet Cartridge		
250-1750ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1755	Outlet Cartridge		
250-1755ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1760	Inlet Housing		
250-1765	Outlet Housing		

ASI Part No.	Description		OEM Reference
250-1770	Inlet Valve		902242
250-1770ACN	Acetonitrile-resistant, Inlet Valve		
250-1775	Outlet Valve		902243
250-1775ACN	Acetonitrile-resistant, Outlet Valve		
SSI, Accuflow Series 1, 2, 3, 4 PEEK			
250-1752	Inlet Cartridge, Direct Replacement, PEEK		
250-1757	Outlet Cartridge, Direct Replacement, PEEK		
SSI, 200, 220, 222, 300 Standard Head			
200-1340	Piston Seal, UHMW, each		
200-1345	Piston Seal, UHMW, pk 10		
200-1344	Wash Seal, UHMW, each		
200-1349	Wash Seal, UHMW, pk 10		
260-1200	Self-flush Piston with Sapphire Rod		02-0567
260-1205	Piston with Sapphire Rod		02-0101
SSI, 200, 220, 222, 300, 350 SS			
250-1720	Inlet Cartridge		
250-1720ACN	Acetonitrile-resistant, Inlet Cartridge		

ASI Part No.	Description		OEM Reference
250-1725	Outlet Cartridge		
250-1725ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1730	Inlet Housing		
250-1735	Outlet Housing		
250-1740	Inlet Valve		02-0162
250-1740ACN	Acetonitrile-resistant, Inlet Valve		
250-1745	Outlet Valve		02-0163
250-1745ACN	Acetonitrile-resistant, Outlet Valve		
Teledyne Isco, Analytical Inert			
250-1960T	In/Outlet Cartridge, Direct Replacement, Titanium		69-2253-322
250-1960	In/Outlet Cartridge, Direct Replacement, SST		69-2253-321
250-1960ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement, SST		
Teledyne Isco, Swagelok			
250-0580	Inlet Housing		
250-0585	Outlet Housing		

ASI Part No.	Description		OEM Reference
250-0590KC	Inlet Valve		309-0090-12
250-0595KC	Outlet Valve		309-0090-13
Teledyne Isco, Swagelok Vari Pump			
250-0570KC	In/Outlet Cartridge		309-0090-13 & 60-3985-044 & 209-0093-34 & 60-5055-005
Thermo Fisher, TSP SpectraSYSTEM P100, P1000/2000/3000/4000			
200-1210	Piston Seal, UHMW, each		A2962-010 & A3070-010
200-1215	Piston Seal, UHMW, pk 10		
200-1211	Piston Seal, Teflon, each		A2962-010 & A3070-010
200-1212	Piston Seal, Teflon, pk 10		
200-1218	Flush Seal, UHMW, each		A2963-010
200-1219	Flush Seal, UHMW, pk 10		
250-1190	Inlet Cartridge		
250-1190ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1197	Transducer Cartridge		
250-1197ACN	Acetonitrile-resistant, Transducer Cartridge		
250-1200	Inlet Housing		

ASI Part No.	Description		OEM Reference
250-1207	Transducer Housing		
250-1210	Inlet Valve		A3495-010
250-1210ACN	Acetonitrile-resistant, Inlet Valve		
250-1217	Transducer Valve		A3990-010
250-1217ACN	Acetonitrile-resistant, Transducer Valve		
260-1100	Piston with Sapphire Rod		A3102-010
Thermo Fisher, TSP SpectraSYSTEM 3200 Constametric			
200-1280	Piston Seal, UHMW, each		206234
200-1285	Piston Seal, UHMW, pk 10		
200-1281	Piston Seal, Teflon, each		206234
200-1286	Piston Seal, Teflon, pk 10		
200-1287	Replacement Kit contains UHMW Piston Seal, Back-up Washer, 2 Bushings, O-ring		801892001
200-1288	Replacement Kit contains Teflon Piston Seal, Back-up Washer, 2 Bushings, O-ring		801892001
250-1280	Inlet Cartridge		
250-1280ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1285	Outlet Cartridge		
250-1285ACN	Acetonitrile-resistant, Outlet Cartridge		

ASI Part No.	Description		OEM Reference
250-1290	Inlet Housing		
250-1295	Outlet Housing		
250-1300	Inlet Valve		900947001
250-1300ACN	Acetonitrile-resistant, Inlet Valve		
250-1305	Outlet Valve with Adapter Seal		900947002
250-1305ACN	Acetonitrile-resistant, Outlet Valve with Adapter Seal		
250-1307-5	Adapter Seal, pk 5		
260-1180	Piston with Sapphire Rod		801306
Thermo Fisher, Spectra-Physics 8100, 8800, 8810, Isochrom			
200-1210	Piston Seal, UHMW, each		A2962-010 & A3070-010
200-1215	Piston Seal, UHMW, pk 10		
200-1211	Piston Seal, Teflon, each		A2962-010 & A3070-010
200-1212	Piston Seal, Teflon, pk 10		
200-1218	Flush Seal, UHMW, each		A2963-010
200-1219	Flush Seal, UHMW, pk 10		
260-1100	Piston with Sapphire Rod		A3102-010

ASI Part No.	Description	OEM Reference
Thermo Fisher, Spectra-Physics 8100, 8700, 8800, 8810, Isochrom		
200-2510	Piston Seal, UHMW, each (only for model 8700)	
200-2511	Piston Seal, UHMW, pk 10	
250-1190	Inlet Cartridge	
250-1190ACN	Acetonitrile-resistant, Inlet Cartridge	
250-1195	Outlet Cartridge	
250-1195ACN	Acetonitrile-resistant, Outlet Cartridge	
250-1200	Inlet Housing	
250-1205	Outlet Housing	
250-1210	Inlet Valve	
250-1210ACN	Acetonitrile-resistant, Inlet Valve	
250-1215	Outlet Valve	
250-1215ACN	Acetonitrile-resistant, Outlet Valve	
260-1105	Piston with Sapphire Rod (only for model 8700)	
Varian, ProStar 210, 215 / Rainin SD200, SD300 5, 10 & 25 mL/min.		
200-1262	Piston Seal with Back-up Ring, 5 mL/min., UHMW, each	
200-1263	Piston Seal with Back-up Ring, 5 mL/min., UHMW, pk 10	


ASI Part No.	Description		OEM Reference
200-1264	Piston Seal with Back-up Ring, 10 mL/min., UHMW, each		R007101637
200-1265	Piston Seal with Back-up Ring, 10 mL/min., UHMW, pk 10		
200-1266	Piston Seal, 25 mL/min., UHMW, each		R007101643
200-1267	Piston Seal, 25 mL/min., UHMW, pk 10		
250-1590	Inlet Cartridge, 5, 10 mL/min.		
250-1590ACN	Acetonitrile-resistant, Inlet Cartridge, 5, 10 mL/min.		
250-1595	Outlet Cartridge, 5, 10 mL/min.		
250-1595ACN	Acetonitrile-resistant, Outlet Cartridge, 5, 10 mL/min.		
250-1610	Inlet Valve, 5, 10 mL/min.		R007101616
250-1610ACN	Acetonitrile-resistant, Inlet Valve, 5, 10 mL/min.		
250-1615	Outlet Valve, 5, 10 mL/min.		R007101617
250-1615ACN	Acetonitrile-resistant, Outlet Valve, 5, 10 mL/min.		
250-1600	Inlet Housing, 5, 10 & 25 mL/min.		
250-1605	Outlet Housing, 5, 10 & 25 mL/min.		
250-1620	Inlet Cartridge, 25 mL/min.		
250-1620ACN	Acetonitrile-resistant, Inlet Cartridge, 25 mL/min.		

ASI Part No.	Description		OEM Reference
250-1625	Outlet Cartridge, 25 mL/min.		
250-1625ACN	Acetonitrile-resistant, Outlet Cartridge, 25 mL/min.		
250-1640	Inlet Valve, 25 mL/min.		R007101616
250-1640ACN	Acetonitrile-resistant, Inlet Valve, 25 mL/min.		
250-1645	Outlet Valve, 25 mL/min.		R007101617
250-1645ACN	Acetonitrile-resistant, Outlet Valve, 25 mL/min.		
260-1176	Piston with Sapphire Rod, 5 mL/min.		R007101657
260-1177	Piston with Sapphire Rod, 10 mL/min.		R007101658
Varian, PrepStar SD-1 200, 500 & 800 mL/min.			
200-1268	Piston Seal, UHMW, each (only for 200 mL/min.)		
200-1269	Piston Seal, UHMW, pk 10 (200 mL/min.)		
200-1273	Wash Seal, UHMW, each (only for 200 mL/min.)		
200-1274	Wash Seal, UHMW, pk 10 (200 mL/min.)		
250-1649	In/Outlet Cartridge (only for 500 & 800)		
250-1649ACN	Acetonitrile-resistant, In/Outlet Cartridge		
250-1650	In/Outlet Cartridge, Direct Replacement (only for 500 & 800 mL/min.)		
250-1650ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement (500 & 800 mL/min.)		







ASI Part No.	Description		OEM Reference
250-1651	Inlet Housing (only for 500 & 800)		
250-1656	Outlet Housing (only for 500 & 800)		
250-1652	Inlet Valve (only for 500 & 800)		R007105686
250-1652ACN	Acetonitrile-resistant, Inlet Valve		
250-1657	Outlet Valve (only for 500 & 800)		R007105687
250-1657ACN	Acetonitrile-resistant, Outlet Valve		
Varian, 2010, 2510			
200-1271	Piston Seal, UHMW, each		03-997261-37
200-1276	Piston Seal, UHMW, pk 10		
250-1560	Inlet Cartridge		
250-1560ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1565	Outlet Cartridge		
250-1565ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1570	Inlet Housing		
250-1575	Outlet Housing		
250-1580	Inlet Valve		03-997261-09
250-1580ACN	Acetonitrile-resistant, Inlet Valve		

ASI Part No.	Description		OEM Reference
250-1585	Outlet Valve		03-997261-10
250-1585ACN	Acetonitrile-resistant, Outlet Valve		
260-1171	Piston with Sapphire Rod		03-997261-08
Varian, 5000, 5020, 5060, 5500, 5560			
200-1270	Piston Seal with Back-up Washer, UHMW, each		27-459633-00
200-1275	Piston Seal with Back-up Washer, UHMW, pk 10		
250-1345	Outlet Cartridge		
250-1345ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1350	Outlet Housing		
250-1355	Outlet Valve		03-905201-00
250-1355ACN	Acetonitrile-resistant, Outlet Valve		
260-1170	Piston with Sapphire Rod		03-905337-00
Varian, 9010, 9012, 9020, 220, 230, 240			
200-1278	Piston Seal, UHMW, each		03-919397-00
200-1279	Piston Seal, UHMW, pk 10		
200-1258	Inlet Valve Seal, UHMW, each		03-919488-00

ASI Part No.	Description		OEM Reference
250-1558	Inlet Valve Rebuild Kit contains Inlet Valve Seal, Inlet Valve Seat, Inlet Valve Bushing, Back-up Washer, Compression Spring, Spring Retainer, Retainer Ring, O-ring		03-919085-00
250-1535	Outlet Cartridge		
250-1535ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1545	Outlet Housing		
250-1555	Outlet Valve		03-919465-90
250-1555ACN	Acetonitrile-resistant, Outlet Valve		
260-1175	Piston with Sapphire Rod		03-919180-00
Varian, 212 LC			
A500-1009-U-2	Piston Seal Assembly, UHMW, pk 2		ASA5001009U2 & ASA5001009U10
A500-1009-U-10	Piston Seal Assembly, UHMW, pk 10		
A500-1023-02	Wash Seal Assembly, UHMW, pk 2		ASA50010232 & ASA500102310
A500-1023-10	Wash Seal Assembly, UHMW, pk 10		
A500-1133	In/Outlet Cartridge, Direct Replacement		ASA5001133
A500-1133ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement		
500-1131	Inlet Housing		AS5001131
500-1132	Outlet Housing		ASA5001132

ASI Part No.	Description		OEM Reference
A500-1134	Inlet Valve		ASA5001133 & ASA5001131
A500-1134ACN	Acetonitrile-resistant, Inlet Valve		
A500-1128	Outlet Valve		ASA5001133 & ASA5001132
A500-1128ACN	Acetonitrile-resistant, Outlet Valve		
A500-1180	In/Outlet Check Valve Filter Assembly		ASA5001180
A500-1117	Piston with Ceramic Rod		ASA5001117

Waters, Alliance Model 2690, 2695, 2790, 2795, 2796

200-0210	Piston Seal, High Pressure, UHMW, each		270938
200-0215	Piston Seal, High Pressure, UHMW, pk 10		
200-0220	Seal Wash Piston Seal, UHMW, each		271018
200-0225	Seal Wash Piston Seal, UHMW, pk 10		
200-0230	Seal Wash Face Seal, UHMW, each		271017
200-0240	Wash Tube Seal, UHMW, each		270940
200-0250	Pump Head Face Seal, UHMW, each		270939
260-1245	Piston with Sapphire Rod		270959

Waters, Alliance Model 2695, 2795, 2796, 616 SS



ASI Part No.	Description		OEM Reference
250-1040	Inlet Cartridge, Direct Replacement		
250-1040ACN	Acetonitrile-resistant, Inlet Cartridge, Direct Replacement		
250-1045	Outlet Cartridge, Direct Replacement		
250-1045ACN	Acetonitrile-resistant, Outlet Cartridge, Direct Replacement		
250-1050	Inlet Housing		
250-1055	Outlet Housing		
250-1060	Inlet Valve		55845 & 24960
250-1060ACN	Acetonitrile-resistant, Inlet Valve		
250-1065	Outlet Valve		55844 & 24960
250-1065ACN	Acetonitrile-resistant, Outlet Valve		
Waters, Alliance Model 2690, 2790, 2796			
250-1070	In/Outlet Cartridge, Direct Replacement		270941
250-1070ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement		
270-0944	PM Kit contains 2 UHMW Piston Seals, 4 Pump Head Face Seals, 2 Inlet/Outlet Cartridges, 2 Pistons , 4 SST Solvent Filters		270944
Waters, Alliance Model 2690, 2695, 2790, 2795, 717, LCM 1			
850-0945	Replacement Insert 2 Micron Filter		WAT088084

ASI Part No.	Description		OEM Reference
Waters, Acquity UPLC			
250-1497	Check Valve, UPLC Primary with Gasket, each		700002596
250-1497ACN	Check Valve, UPLC Primary with Gasket, each		
250-1497-2	Check Valve, UPLC Primary with Gasket, pk 2		
250-1497ACN-2	Check Valve, UPLC Primary with Gasket, pk 2		
250-1498	Intelligent Valve with Gasket, each		700003563
250-1498-2	Intelligent Valve with Gasket, pk 2		
250-1499	Check Valve, Double B & S with Gasket, each		700002968
250-1499ACN	Check Valve, Double B & S with Gasket, each		
250-1499-2	Check Valve, Double B & S with Gasket, pk 2		
250-1499ACN-2	Check Valve, Double B & S with Gasket, pk 2		
250-1598	H-Class QSM Valve Cartridge, each		700005165
250-1598-2	H-Class QSM Valve Cartridge, pk 2		
250-1599	H-Class QSM Valve Cartridge with Double B & S, each		700005164
250-1599ACN	H-Class QSM Valve Cartridge with Double B & S, each		
250-1599-2	H-Class QSM Valve Cartridge with Double B & S, pk 2		
250-1599ACN-2	H-Class QSM Valve Cartridge with Double B & S, pk 2		
260-1400	Piston with Sapphire Rod		700002600
Waters, M45, 45G, M501, 510, 515, 590, 600, 600E, 610, 1515, 1525 (Analytical), 6000, 6000A, LCM1			
200-1202	Piston Seal with Teflon Gasket, UHMW, each		022934 & 022946
200-1203	Piston Seal with Teflon Gasket, UHMW, pk 10		
200-1204	Piston Seal with Teflon Gasket, Teflon, each		026613
200-1205	Piston Seal with Teflon Gasket, Teflon, pk 10		

ASI Part No.	Description		OEM Reference
250-1100	Inlet Cartridge		
250-1100ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1105	Outlet Cartridge		
250-1105ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1110	Inlet Housing		
250-1115	Outlet Housing		
250-1120	Inlet Valve		033679 & 700000253
250-1120ACN	Acetonitrile-resistant, Inlet Valve		
250-1125	Outlet Valve with Adapter Seal (only for M45, 45G, 510, 515, 590, 1515, 1525 (Analytical), 6000, 6000A, LCM1)		025216 & 700000253
250-1125ACN	Acetonitrile-resistant, Outlet Valve with Adapter Seal		
250-1127	Outlet Valve with Adapter Seal (only for M501, 600, 600E, 610)		025216 & 700000253
250-1127ACN	Acetonitrile-resistant, Outlet Valve with Adapter Seal		
250-1135-5	Adapter Seal, pk 5 (only for M45, 45G, 510, 515, 590, 1515, 1525 (Analytical), 6000, 6000A, LCM1)		
250-1137-5	Adapter Seal, pk 5 (only for M501, 600, 600E, 610)		
260-1120	Piston with Sapphire Rod (only for M45, 45G, 501)		026524

ASI Part No.	Description		OEM Reference
260-1125	Piston with Sapphire Rod (only for M510, 515, 590, 600, 600E, 610, 1515, 1525 (Analytical), 6000, 6000A, LCM1)		025656
Waters, Extended Flow 225 µL Head #3 M510 EF, 590 EF, 600 EF, 600E EF, 610 EF, 650 EF, 6000 EF, 6000A EF, LCM1			
200-1206	Piston Seal, Teflon, each		026644
200-1207	Piston Seal, Teflon, pk 10		
200-1208	Piston Seal, UHMW, each		026644
200-1209	Piston Seal, UHMW, pk 10		
250-1900	Inlet Cartridge		
250-1900ACN	Acetonitrile-resistant, Inlet Cartridge		
250-1905	Outlet Cartridge		
250-1905ACN	Acetonitrile-resistant, Outlet Cartridge		
250-1910	Inlet Housing		
250-1915	Outlet Housing		
250-1920	Inlet Valve		60307
250-1920ACN	Acetonitrile-resistant, Inlet Valve		
250-1925	Outlet Valve with Adapter Seal (only for Extended Flow 225 µL Head #3 M510 EF, 590 EF, 6000 EF, 6000A EF, LCM1)		025216
250-1925ACN	Acetonitrile-resistant, Outlet Valve with Adapter Seal		

ASI Part No.	Description		OEM Reference
250-1927	Outlet Valve with Adapter Seal (only for Extended Flow 225 μ L Head #3 M600 EF, 600E EF, 610 EF, 650 EF)		025216
250-1927ACN	Acetonitrile-resistant, Outlet Valve with Adapter Seal		
250-1135-5	Adapter Seal, pk 5 (only for Extended Flow 225 μ L Head #3 M510 EF, 590 EF, 6000 EF, 6000A EF, LCM1)		
250-1137-5	Adapter Seal, pk 5 (only for Extended Flow 225 μ L Head #3 M600 EF, 600E EF, 610 EF, 650 EF)		
260-1110	Piston with Sapphire Rod		060304
Waters, 600			
270-0755	PM Starter Kit contains 2 UHMW Piston Seals, 2 Inlet Check Valves, 2 Outlet Check Valves, 2 Pistons, 4 SST Solvent Filters		052675
270-0765	PM Kit contains 2 UHMW Piston Seals, 2 Inlet Cartridges, 2 Outlet Cartridges, 2 Pistons, 4 SST Solvent Filters		052676
Waters, 625, 626 PEEK			
250-1010	Inlet Cartridge, Direct Replacement		02412
250-1015	Outlet Cartridge, Direct Replacement		02412
Waters, 616, 625, 626			
260-1240	Piston with Sapphire Rod		031788
YL, 9100, 9300			

ASI Part No.	Description		OEM Reference
200-2411	Piston Seal, UHMW, each		1622421070
200-2412	Piston Seal, UHMW, pk 10		
250-2400	In/Outlet Cartridge, Direct Replacement		1602424071
250-2400ACN	Acetonitrile-resistant, In/Outlet Cartridge, Direct Replacement		

Maintenance & Trouble Shooting Tips - Check Valves

The following tips are derived from our many years of working with HPLC pumps, and are presented here to assist the chromatographer or service technician to prevent problems from occurring, and diagnosing and solving them when they do occur.

■ Expected Service Life

The life of a check valve depends entirely upon service conditions. There are only three things that will compromise life of an AS/ check valve: contamination from the mobile phase, contamination from pump seal wear material, and build-up of salts in the valve. If the guidelines below are adhered to, you can expect several years of reliable service from AS/ valves (many of the AS/ valves that were put into service for reliability testing in 1992 are still in service now).

However, for the best assurance of reliability and repeatable retention times, we recommend a policy of replacing the valves every second time the piston seals are replaced.

■ Keeping Them Clean

1. Solvent inlet filter

Always use a 10 micron or finer filter on the solvent intake line. Even if you use HPLC grade solvent, the solvent can become contaminated with dust particles by even a few hours of exposure to air in an open container. The reliability of a check valve can be seriously impaired by contamination. If you see your service technician “checking out” your pump and he is not using filters – **STOP HIM!** Even if the valves still work normally, your system is going to be contaminated!

2. Outlet valve filter

The purpose of the outlet valve filter is to guarantee reliability by preventing seal wear material and other contaminants from entering the outlet valve. For most chromatographers the added reliability is worth the extra effort to replace the filter every two or three years. However, users may elect to eliminate the outlet filter by substituting an inlet cartridge for an outlet, since for most pumps an AS/ inlet valve is interchangeable with the outlet except for the filter. Please consult technical support if you need more information.

Inspect the filter on the outlet cartridge whenever you change a pump seal. If there is excessive residue on the filter, it is advisable to replace the filter. On most pumps the filter will last for at least 2 years before it needs to be changed, but if seals are wearing out frequently* then the filter life will be shorter due to a buildup of seal wear material.

3. Cleaning dirty valves

Use a syringe to flush the valve with 50 mL of clean HPLC grade IPA or water. This simple procedure works 90% of the time. If not, then place the valve in 20% nitric acid and sonicate for a maximum of 20 minutes. Follow this by flushing the valve with 50 mL of HPLC grade water (*wear safety goggles so you don't get acid in your eyes!*).

Note: Sonication will eventually cause fretting damage between the ball and seat, so do not sonicate more than 20 minutes.

■ Long Term Storage: stuck check valves

Highly polished surfaces such as the sapphire, ruby or ceramic ball and seat in check valves will tend to bond to each other when allowed to dry out. The severity of this problem depends on what solvent was last in contact with the ball and seat. With acetonitrile, the problem is quite severe; with most other solvents the problem is not quite so noticeable but will still occur occasionally.

While this problem will almost never occur when valves are installed in a pump (it is virtually impossible for a valve to dry out while installed), it can occur during long-term storage. The best way to prevent this from happening is to store the valve in the original bag that the valve was shipped in, and filling the bag with several ml of isopropanol. Water can also be used as long as 20% isopropanol is added to prevent biological growth. Valves that are stored in solvent (even acetonitrile) will not become stuck.

■ Diagnosing Valve Problems: distinguishing between inlet and outlet valve failure

Most valve problems are due to the inlet valve, since the outlet valve usually has a filter to protect it. If valve problems are suspected, the following test will help verify that the inlet valve is indeed the problem. Set the solvent bottle at the same level as the pump and introduce a small air bubble into the intake line. With the pump running under pressure, monitor progress of the bubble up the line. If the air bubble progresses towards the pump without any backward motion, then both inlet and outlet valves are working normally. If the air bubble moves back and forth in-sync with the pump stroke, then the inlet valve is failing to close properly.

Maintenance & Trouble Shooting Tips - Pistons

It is hard to believe that sapphire, one of the hardest materials known to man, could ever be worn out or scratched by a soft material like Teflon or UHMW-PE. Unfortunately it does wear out. As the seal gets used, small particles of salt crystals, metal fragments, and other contaminants become embedded in the sealing surface of the seal. Over time these contaminants abrade the sapphire or ceramic plunger and form flat spots or longitudinal scratches. These wear spots will destroy any seal in a very short time.

It is extremely important to inspect the sapphire or ceramic plunger whenever you replace a seal. If there are any signs of scratches or glazed spots, replace the piston. Failure to do so will result in a shredded seal and a pump head full of seal wear material.

It is very difficult to see worn spots on a sapphire or ceramic piston. Hold the piston up to a bright light and inspect with a 10x magnifier or microscope. Any spot that appears dull, glazed, or scratched is a sure sign of a worn piston.

Another problem that is not discussed as often is the design of the liquid end of the pump. Some pumps are designed so that contact may occur between the piston and a metal or ceramic back-up ring. Such problems are usually due to a failure on the part of the pump designer to account for the accumulation of concentricity, or run-out tolerances between the piston and the metal back-up washers that support the seal. If you observe premature seal failure even after replacing your piston, then re-inspect the piston. If signs of scoring, or a glazed spot, appear on the new piston, then you may have a serious hardware design flaw that has nothing to do with your piston or seal. Contact ASI technical service for advice.

Maintenance & Trouble Shooting Tips - Pump Seals

■ Service Life

There are two ways that we define service life: one is when the leak rate becomes excessive (more than 1% of set point flow rate); the other is when the seal begins to shed so much wear material that the valves and other hydraulic components begin to fail from contamination. We have run a number of life tests here at ASI comparing UHMW-PE to Teflon. In general, they both last equally long if you consider only the leak rate. The UHMW-PE wears less, but because it is a stiffer material it will not continue to conform to the piston when the inside sealing surface begins to wear away. On the other hand, Teflon wears much faster, but it is more compliant and so it continues to seal despite being badly worn. However, if you consider the shed rate of wear material as the criterion, then UHMW-PE is the clear winner because it sheds far less material than the Teflon compounds. Due to the importance and expense of the hydraulic components in the HPLC system, we firmly believe that when a seal generates an excessive amount of wear material its useful service life has been exceeded. Accordingly, the UHMW-PE compounds have a much greater service life than Teflon.

■ Seal Compliance

Teflon is a softer and more compliant material than UHMW-PE, so it will conform better to a worn or out-of-round piston. Also, if the piston is worn or scratched, it may leak whereas a Teflon seal might still work for a while (*but don't count on that for long – replace that worn piston ASAP!*). If your newly installed UHMW-PE seals do leak when they are first installed, run the pump at 2,000 PSI or more for 30 minutes with IPA or Water, and the leak will stop as the seal conforms to the seal cavity and piston. If the leak doesn't stop after 30 minutes, then it was either damaged during installation or the piston is worn or scratched and must be replaced.

■ Solvent Compatibility

Teflon is absolutely inert to any HPLC solvent, period. UHMW-PE compounds may exhibit reduced life when used with very strong organic solvents like pure methylene chloride and toluene. However, it is important to bear in mind that solvent compatibility is a rather minor issue when compared to other factors such as what pump you have, the condition of the piston, and whether the seal was damaged during installation.


■ Installation

If the seal is badly worn, then the pump head will be contaminated with seal wear material. Remove the check valves and seal from the pump head and sonicate the head in 20% nitric acid for 30 minutes. Rinse thoroughly, then sonicate for 10 minutes in DI water. Blow dry with oil free compressed gas or air. The inlet valve should be flushed with 50 mL of HPLC grade isopropanol or water, and the outlet valve filter inspected (if there is no filter on the outlet, then flush with 50 mL of HPLC grade IPA or water). Carefully inspect the piston for worn spots or scratches.

Wet the seal and pump head with isopropanol prior to reassembly. IPA serves both as a lubricant and surface wetting agent, which will reduce the amount of air trapped in the head.

Install the new seal, using an installation tool if available. Use great caution not to damage the lip of the seal during installation. Run the pump with IPA at about 2,000 PSI for 30 minutes to set the seal. If the seal leaks after the first 30 minutes:

1. Check that the seal lip was not damaged during installation.
2. Carefully examine the piston for wear or scratches. It is difficult to detect a damaged or worn piston. Use a magnifying glass to identify any glazed or "frosted" spots, axial grooves or scratches. When in doubt, replace the piston.

A decorative background consisting of a grid of squares in various shades of blue, ranging from light to dark, with thin white lines separating the squares.

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