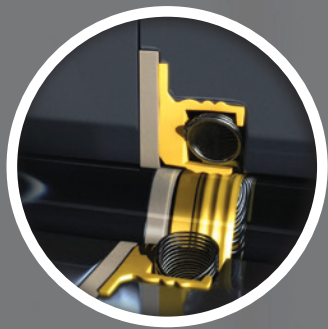


High Performance UHPLC Pump Seals

**Bal Seal® spring-energized seal:
Compact design, consistently low friction**



The Bal Seal provides consistently low friction for more than 1 million cycles to meet demanding PM requirements. Precision-machined from PTFE or polyethylene materials, our seal is compatible with the wide variety of solvents and buffers used in (U)HPLC equipment. The seal's Bal Spring energizer, with its individual canted coils, provides consistent force that promotes even wear, prolongs service life, and minimizes flow path contamination.





In HPLC, UHPLC, and chromatography pumps, no other seal can match the superior low friction performance and chemical compatibility of the Bal Seal®. Here's why:

Bal Seal® feature	Why is it relevant?	What's the benefit?
Seal Geometry	<ul style="list-style-type: none"> • Low friction • Small diameter 	<ul style="list-style-type: none"> • Minimizes heat generation that can reduce pump life • Increases time between PM • Fits in small space • Reduces contact stress and friction • Retrofit-ready to meet hardware requirements • Protects motor from media ingress
PTFE & UHMWPE Seal Jacket Materials	<ul style="list-style-type: none"> • Low friction • Chemically compatible • No foreign particulates 	<ul style="list-style-type: none"> • Reduces seal wear & optimizes equipment life • FDA compliant & compatible materials for use in food, pharmaceutical, other sensitive testing • Chemically compatible with aggressive solvents & buffers
Spring Energizer	<ul style="list-style-type: none"> • Biocompatible • Corrosion resistant • Consistent force 	<ul style="list-style-type: none"> • Biocompatible material suitable for aggressive media • Compact design to meet any retrofit requirements • Consistent friction with targeted seal force to enhance life
Backup Ring	<ul style="list-style-type: none"> • Reduces misalignment • High pressure resistance and reduced seal extrusion • Resistance to thermal cycling 	<ul style="list-style-type: none"> • Supports seal at high pressures, minimizing extrusion and shaft-to-bore misalignment (STBM) • Designed for galvanic compatibility with gland for consistent support over millions of cycles

Factors Impacting UHPLC Pump Design

FRICITION

- Heat generation in a sensitive temperature environment can damage a sample
- Influenced by temperature, pressure, and hardware surface finish
- Impacts motor's power efficiency

ENVIRONMENTAL CONDITIONS

- Applications in laboratory demanding accuracy, consistency, and precision with no room for failure or inconsistent performance
- Exposure to highly aggressive solvents and buffers at all ranges of pH requiring millions of cycles
- Massive pressure ranges from >18 kpsi to vacuum environment in a short time, at medium reciprocating speeds

Key UHPLC Pump Seal Design Considerations

- Low friction (minimizes damage to the sample and less impact on motor)
- Sealing efficacy (prevents contamination and inaccurate results)
- Chemical Compatibility (biocompatible solutions)
- Seal service life (achieves consistent life cycle requirements)

Get a custom seal proposal in 3 working days and a prototype in 4-6 weeks. Leverage our engineering expertise to save time and money in development and testing.

REQUEST A DESIGN



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