FLOWSERVE

SLM Series
slurry seals

Engineered for applications typical with mineral and ore processing



Experience In Motion

FLOWSERVE

A family of self contained cartridge seals designed for reliable operation in the majority of slurry services. Engineered to operate with no outside flush liquid to eliminate product dilution, increase plant efficiency and reduce operating costs.



The most advanced slurry sealing technology

No process bypass or external flush liquid is needed, eliminating product dilution for better chemical stability. This increases product pumpage to raise production and reduce the operating expense of complicated packing or seal water support systems.

Cartridge seal configuration makes installation and operation easier. No special tooling needed for installation into equipment. Allows equipment impeller-to-casing clearance adjustments without making modifications to the seal setting.

The SLM Series advantage

- Limited group size seal components covering the broadest range of shaft diameters. Fits most pump models that minimizes spare seal inventory requirements to reduce capital costs.
- Abrasion-resistant and corrosion-resistant wetted metal surfaces. Provides seal life consistent with rotating equipment wear components and materials of supply.
- Standardized modular designs for replacing seal wear parts. Exchange the entire cartridge or replace individual seal-wear parts during routine equipment maintenance. Minimizes repair time and reduces added inventory expenses.
- Clamp collar drive. Maximum axial holding force accomadates coated, hardened or overlaid shaft/sleeve. Does not gall or raise a metal burr common with cup point set screw drives.
- Standard assemblies designed for installation from equipment's wet or dry side. Allows cartridge removal and re-installation to occur consistent with specific equipment designs and industry maintenance practices required when replacing wear components. Reduces assembly complexity and any associated down time.

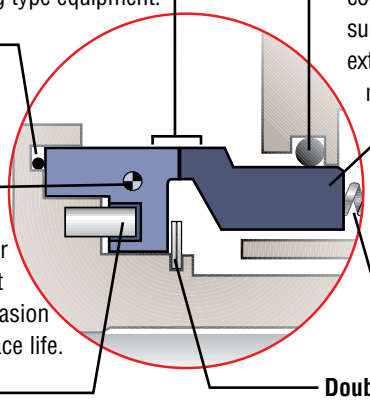
Design features that extend seal life

Line-on-line hydraulically balanced faces
Excellent seal reliability and consistent "no visible leakage" operation. Tolerates typical radial shaft deflection as is commonly designed for with slurry handling type equipment.

Improved o-ring location
Static o-rings are located so that they will not add ID hoop stress and place carbide materials in tension.

Centroid loaded monoblock rotor
Helps to maintain zero net deflection when changes in pressure and temperature occur during operation, thereby reducing product leakage and the wear effects of 3-body abrasion to improve performance and extend seal face life.

Stress reducing drive mechanisms
Distributes high torque loads created by thick viscous fluids away from slot edges to prevent possible chipping of carbide surfaces.



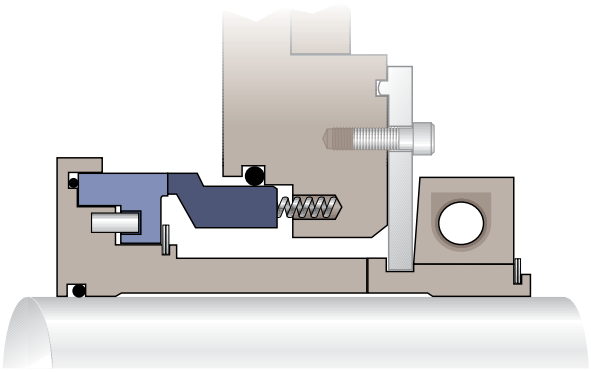
Large cross section stator o-ring
Allows for maximum axial shaft movement while reducing the damaging effects of face cocking or hang-up. Rides on face material surface to prevent metal fret corrosion extending seal life and reducing expensive metal component repair costs.

Flexibly mounted stator
Compensates for deflection and out-of perpendicularity alignment between stationary and rotating components. Springs are isolated from the process liquid to eliminate clogging from process solids and reduce stress corrosion.

Double wound snap ring
Provides positive retention against centrifugal forces even at high speeds.

SLM-6000

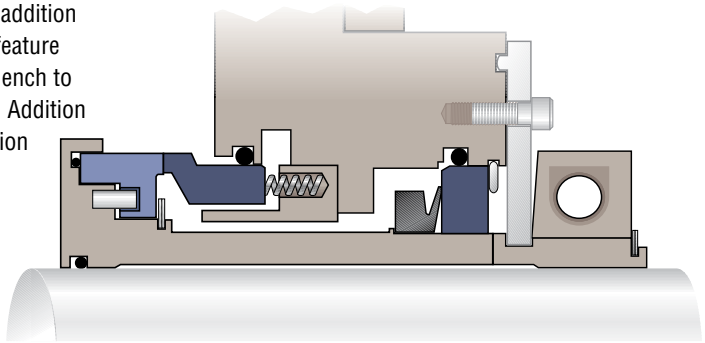
Simple, single, balanced, multi-spring pusher, cartridge seal specifically designed to operate without a process bypass or external flush liquid in the majority of common slurry services associated with the mineral and ore processing industry.



SLM-6000 QCD

Primary seal is the same as the **SLM-6000** with the addition of a **Quench Containment Device** (**QCD**). The **QCD** feature allows for the use of a low-pressure fluid (water) quench to be applied to the atmospheric side of the seal faces. Addition of a fluid quench has proven to enhance seal operation characteristics in hot and scaling slurry services.

For more information on the QCD auxiliary, see Flowserve Data Sheet FSD146



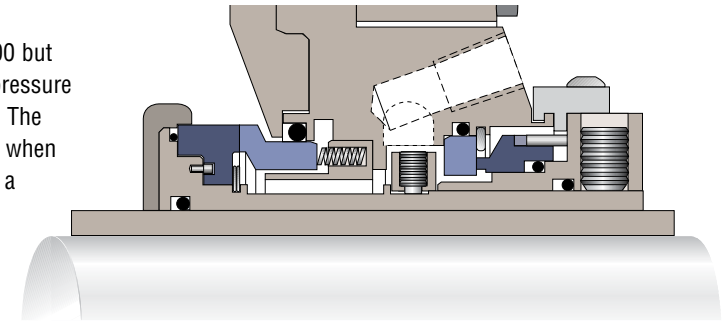
SLM-6000 SLD

Same as the **SLM-6000 QCD** with the addition of a **Synthetic Lubrication Device** (**SLD**). Injection of **DuraClear** synthetic or semi synthetic grease applied to the atmospheric side of the seal faces has been demonstrated to help seal performance during periods of starved suction or when equipment is operated dry.

For more information on the SLD auxiliary, see Flowserve Data Sheet FSD148 and for more information on DuraClear synthetic luricants, see Data Sheet FSD123.

SLM-6100

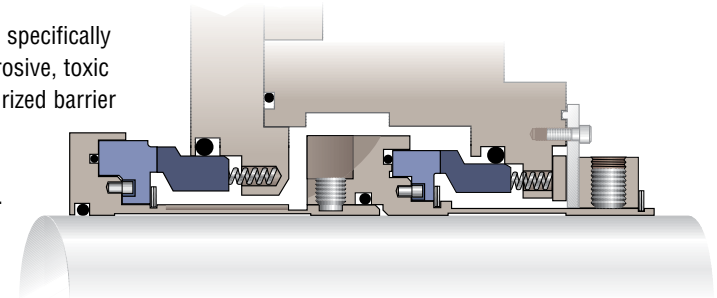
Primary seal faces are the same as the single SLM-6000 but are placed in a tandem arrangement along with a low pressure secondary seal having carbon vs. silicon carbide faces. The secondary seal is engineered to last longer than a QCD when a fluid quench is applied. It can also allow operation of a closed loop fluid system when the secondary seal is fitted with a quench circulating device.



SLM-6200

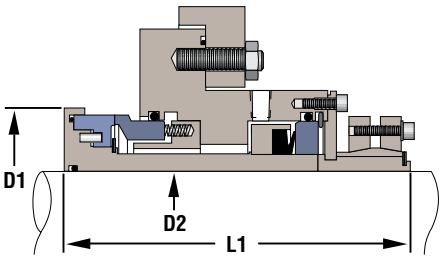
Dual, balanced, multi-spring pusher, cartridge seal, specifically engineered to operate in slurry services where corrosive, toxic or volatile liquids are being handled. Uses a pressurized barrier fluid to prevent process liquid from reaching the atmosphere when a single seal is not acceptable to provide proper environmental or operational safety. As with the single SLM-6000 version, no process bypass or external flush liquid is required when installing into an open taper bore seal chamber to reduce product dilution effects.

For more information on the Erosion Protection Device (EPD) auxiliary depicted, see Flowserve Data Sheet FSD163



Operating Parameters

Maximum Seal Chamber Pressure	17.2 bar (250 psi)
Process Temperature Range (with water quench)	-18 to 79°C (0 to 175°F) 0 to 135°C (32 to 275°F)
Maximum Slurry Particle	MOHS 9 (scale 1 to 10) MOHS Hardness
Maximum Slurry % Solids by Weight	40 %
Maximum Particle Size	6000 Micron
Maximum Surface Speed	up to 23 m/s (75 fps)



Dimensional Data

in millimeters

SLM Size	L1	D1	D2 Max
50.80	119.4	88.90	49.25
54.00	118.0	92.08	52.40
60.33	122.5	98.43	58.75
66.68	126.8	104.8	64.31
82.55	125.7	125.7	78.66
104.8	133.9	154.2	104.0
136.5	149.7	185.9	135.0
187.3	189.6	242.9	185.0
235.0	216.8	310.1	230.1

inches

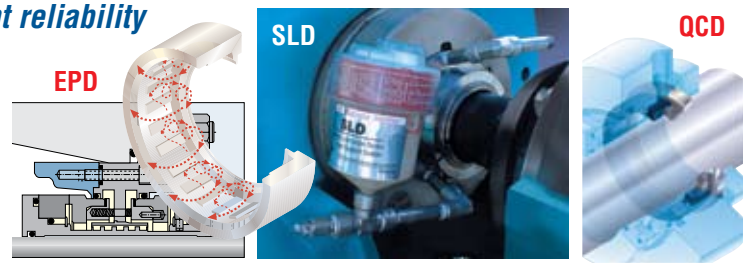
SLM Size	L1	D1	D2 Max
2.000	4.702	3.500	1.939
2.125	4.644	3.625	2.063
2.375	4.824	3.875	2.313
2.625	4.991	4.125	2.532
3.250	4.948	4.950	3.097
4.125	5.270	6.070	4.096
5.375	5.894	7.320	5.314
7.375	7.463	9.562	7.282
9.250	8.537	12.210	9.061

Materials of Construction

Wetted Metal Parts	CD4MCuN , Alloy C-276 , High Chrome Iron (standard) (other materials available upon request)
Seal Faces	Sintered Silicon Carbide (standard) Reaction Bonded Silicon Carbide (optional) Tungsten Carbide (optional)
Springs	Alloy C-276
Elastomers	EPDM, Fluoroelastomer, TFE-propylene (standard) (other materials available upon request)

Auxiliary devices to increase equipment reliability

Flowserve offers devices for the SLM Series seals like the Erosion Protection Device (EPD), Quench Containment Device (QCD) and Synthetic Lubrication Device (SLD). These auxiliary products enhance seal performance in severe services and during off-design point operation events.



FSD166eng REV 09-12 Printed in USA

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