



Diamond-Coated Seal Faces

Material solutions for challenging applications

Upgrade to diamond coatings for superior performance advancements over all other hard seal face materials.



Extend mechanical seal reliability and life

Seal face materials have always been challenged to provide reliable operation in low-lubricity fluids. In the past, this challenge was addressed by lubricating seal faces with a cool, clean external fluid. Although effective, this solution adds operating costs throughout the life of the seal. Alternatively, dual seals operating on clean barrier fluid offer longevity with lower operating costs, but higher initial cost for the required support system. The ideal solution is to have the mechanical seal faces lubricated by the process fluid. Pure, crystalline diamond grown onto a seal face through a rigorous treatment process, including chemical vapor deposition, enables Flowserve to offer improved reliability in poor lubricating fluids without additional controls.

Features and benefits

- The lowest friction of any seal face material provides cool-running seal faces in poor-lubricity fluids such as hot water.
- Bonding the hardest known material to the seal face's running surface gives maximum resistance to abrasive particle damage.
- The highest chemical resistance of all seal face materials enables its use in aggressive acids, alkalines and caustics.
- High wear resistance brings forgiveness for off-design operation such as intermittent dry running.
- Fine grain diamond coatings can run against all common mating face materials, including silicon carbide, tungsten carbide and itself.

Applications

Diamond-coated seal faces offer performance benefits in a wide range of mechanical seal applications, including:

Upstream oil and gas

- Produced water
- Crude oil pipeline
- Multiphase pumps

Refinery and petrochemical

- Dirty hydrocarbons
- Light hydrocarbons
- Caustics

Mining

- Abrasive slurries

Power

- FGD slurries
- Boiler feed water
- Cooling water

Chemical

- Loading and unloading pumps
- Fluids with entrained gases
- Dissolved or hard solids

General industry

- Batch processes
- Fibrous slurries

Availability

Most Flowserve seals are available with diamond-coated seal faces, including:

- QB series
- BX series
- ISC2 series
- U series
- D series
- SLC
- SLM
- HSH
- PSS 4
- Pac-Seal®

Consult your local Flowserve representative for information on diamond coating availability in other mechanical seals.



3D analysis and photographic image of the seal face surface reveals no damage to the diamond-coated silicon carbide (right) after more than 4,000 hours of operation in hot water. The pitting damage on the uncoated silicon carbide face (left) was evident after just 200 hours under the same conditions.

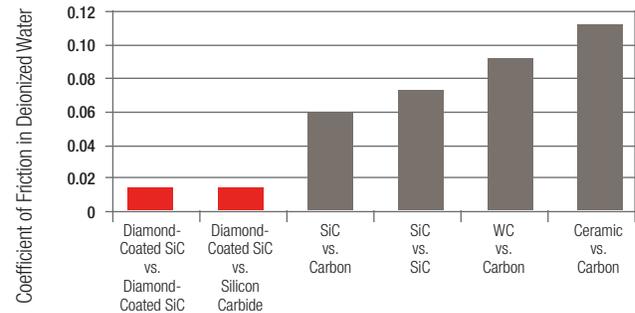
Material properties

Young's Modulus	960 GPa
Fracture Strength	2.9 to 5.3 GPa
Thermal Conductivity	550 to 1,800 W/mK
Hardness	10,000 HV

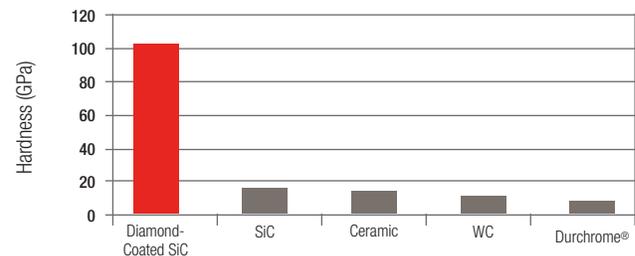
Operating parameters

Pressure	0 to 140 barg (2,030 psi)
Temperature	-40°C to 204°C (-40°F to 400°F)
Speed	up to 46 m/s (150 fps)
Shaft Sizes	12.7 to 241.3 mm (0.500 to 9.500 in)
Viscosity	0.2 to 5,000 cP
Specific Gravity	0.4 to 2.0

Flowserve diamond-coated seal faces offer the lowest coefficient of friction for cool operation.



Flowserve diamond-coated silicon carbide provides the highest hardness for excellent wear resistance.



SSFLY000246-02 (EN/AQ) March 2021

Headquarters

Flowserve Corporation
5215 North O'Connor Blvd.
Suite 2300
Irving, Texas 75039-5421 USA
Telephone: +1 937 890 5839

USA and Canada

Kalamazoo, Michigan USA
Telephone: +1 269 381 2650

Europe, Middle East, Africa

Etten-Leur, The Netherlands
Telephone: +31 765 028 200

Asia Pacific

Singapore
Telephone: +65 6544 6800

Latin America

Mexico City
Telephone: +52 55 5567 7170

Flowserve Corporation has established industry leadership in the design and manufacture of its products. When properly selected, this Flowserve product is designed to perform its intended function safely during its useful life. However, the purchaser or user of Flowserve products should be aware that Flowserve products might be used in numerous applications under a wide variety of industrial service conditions. Although Flowserve can provide general guidelines, it cannot provide specific data and warnings for all possible applications. The purchaser/user must therefore assume the ultimate responsibility for the proper sizing and selection, installation, operation, and maintenance of Flowserve products. The purchaser/user should read and understand the Installation Instructions included with the product, and train its employees and contractors in the safe use of Flowserve products in connection with the specific application.

While the information and specifications contained in this literature are believed to be accurate, they are supplied for informative purposes only and should not be considered certified or as a guarantee of satisfactory results by reliance thereon. Nothing contained herein is to be construed as a warranty or guarantee, express or implied, regarding any matter with respect to this product. Because Flowserve is continually improving and upgrading its product design, the specifications, dimensions and information contained herein are subject to change without notice. Should any question arise concerning these provisions, the purchaser/user should contact Flowserve Corporation at any one of its worldwide operations or offices.

©2021 Flowserve Corporation. All rights reserved. This document contains registered and unregistered trademarks of Flowserve Corporation. Other company, product, or service names may be trademarks or service marks of their respective companies.