

HIGH-PRESSURE FACE-TO-FACE DUAL STATIONARY MULTI-SPRING CARTRIDGE SEAL

For high-pressure process duties and zero-emission requirements

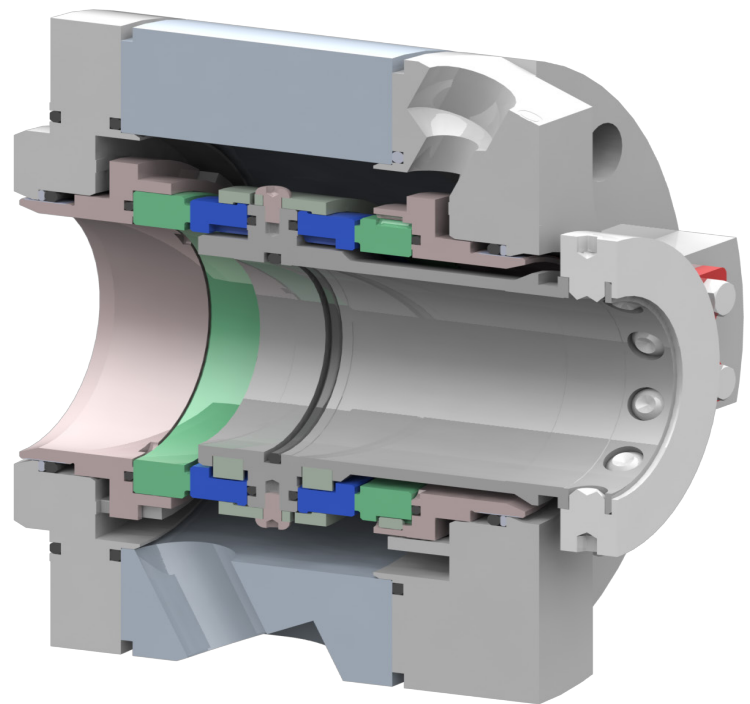
The **Style HPPD** seal is designed for exceptional reliability in demanding applications, such as high-pressure, high-speed, and hazardous services. This seal style addresses the challenges of sealing high pressure process fluids in refinery, pipeline, and power generation industries where zero-emissions are required.

- Versatile across industries: ideal for oil and gas, petrochemical, and power generation.
- Adaptable to process needs: the configurable Arrangement 3 platform can be designed for use with a pressurized API Plan 54 system or a suitable API Plan 53 when equipped with our high-performance pumping ring.
- High torque, high speed: engineered for extreme torque loads and rapid surface speeds, perfect for high-energy pumps where zero emissions are required.

Typical Flush Plans: 54/53B/53C

COMMON APPLICATIONS

- Crude oil
- Amine
- Bitumen
- Ammonia
- Produced water
- Seawater
- Boiler feed water
- Light hydrocarbons



MATERIALS OF CONSTRUCTION

Rotary Faces	Silicon carbide, diamond coating
Stationary Faces	Proprietary FlexSiCG (siliconized carbon/graphite), diamond coating, carbon
Springs	Hastelloy C-276
Metal Parts	316 stainless steel, Alloy 255, Hastelloy C-276
O. Rings	Fluoroelastomers, EPDM, TFEP, Perfluoroelastomers

OPERATING PARAMETERS

Max Temp	550°F (290°C)
Max Pressure	2,000 psi (138 bar)
Max Speed	12,000 FPM (61 m/s)
Max Barrier Pressure	1,500 psi (103 bar)
Min Barrier Pressure Above Process	30 psi (2 bar)

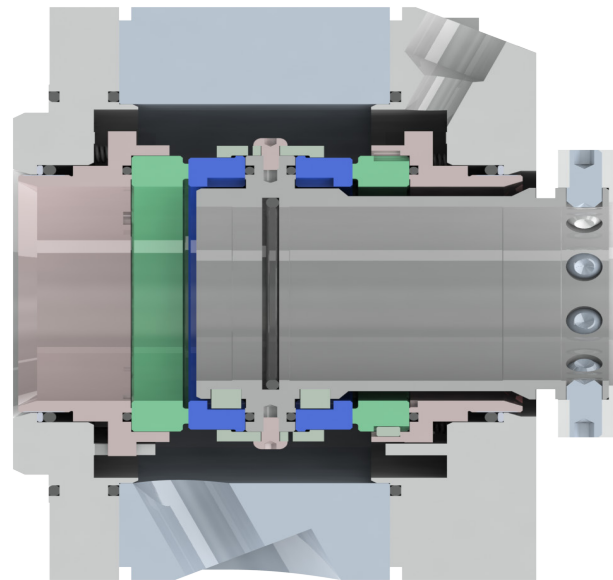
*Max Temperature / pressure / speed indicate operating extremes independently and do not imply the seal will function at these extremes at the same time. Contact Flexaseal if in doubt.

TYPE A | CATEGORY 2 & 3 CONTACTING WET SEALS

Arrangement 3

The **Flexaseal Style HPPD** provides superior design flexibility with highly adaptable features to meet specific application needs and comes standard with:

- High duty seal face materials
 - Premier siliconized carbon/graphite, FlexSiCG, primary ring combines self-lubricating capabilities of carbon/graphite with the rigidity and wear resistance of silicon carbide.
 - Reaction bonded silicon carbide mating rings improve lubricity at the interface.
- Laser-etched lubrication-enhancing features on the mating ring amplify film load support and reduce face-generated heat.
- Robust seal rings with FEA-optimized geometry nearly eliminates seal face deformation.
- Unique mating ring key-drive mechanism evenly distributes drive forces, reducing fracture potential.
- Stationary design allows for high-peripheral speeds.
- Metal-to-metal torque transfer to flexible stationary element eliminates wear-induced seal hang-up.
- Metal oxide coated dynamic O-ring surfaces prevent wear from fretting and ensures smooth long-term operation.
- Separate inboard and outboard mating rings improve safety over designs with a common mating ring by isolating inboard and outboard seals.
- Expansive barrier fluid cavity for thermal management in high pressure applications.



TAILORED SOLUTIONS WITH CUSTOMIZABLE FEATURES FOR ENHANCED RELIABILITY

- Radial or axial pumping ring for barrier fluid circulation without an external pump

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DESIGN FEATURES & BENEFITS

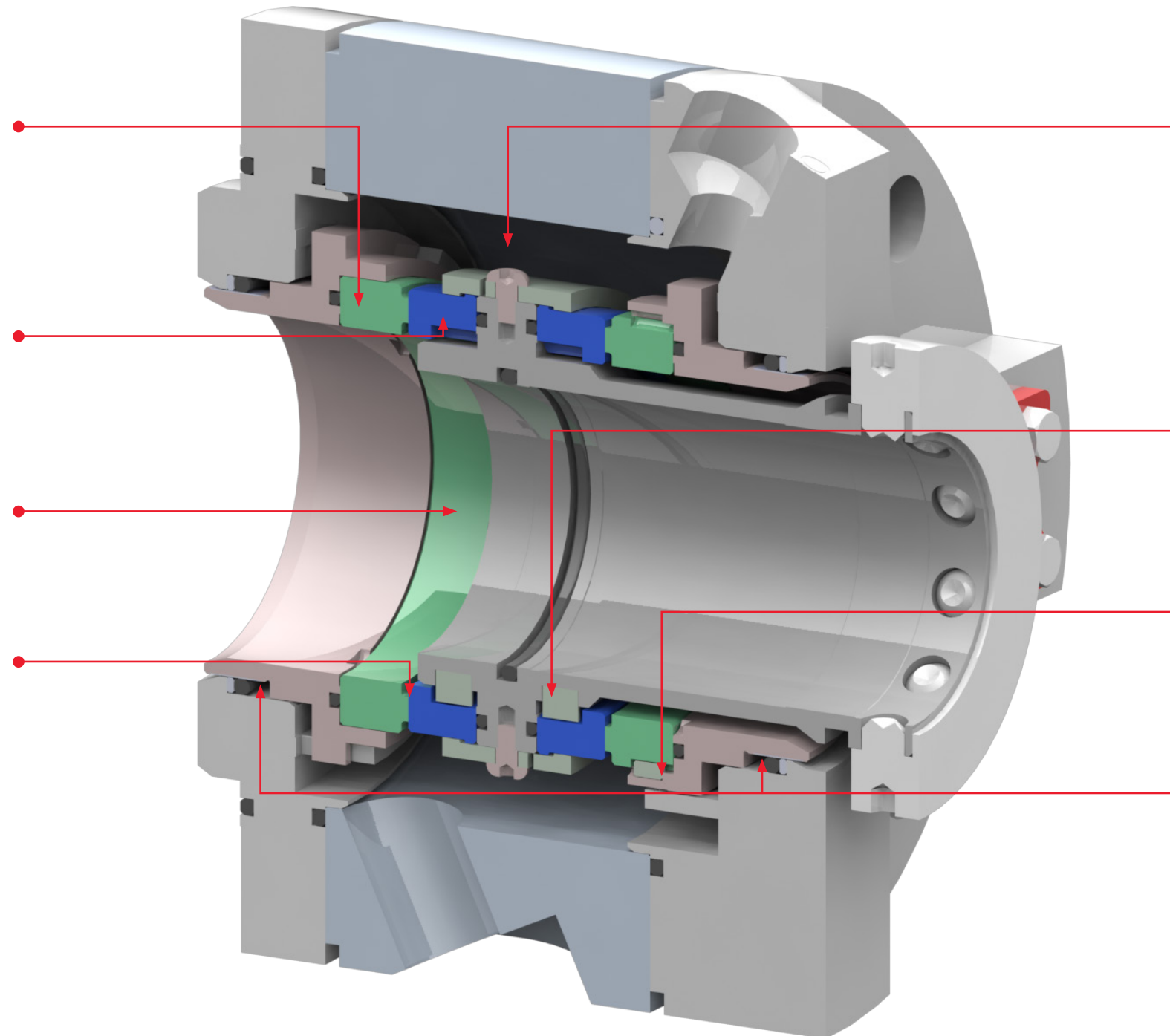
Premier Primary Ring Material FlexSiCG, siliconized carbon/graphite, combines the self-lubricating capabilities of carbon/graphite with rigidity and wear resistance of silicon carbide.

Reaction bonded silicon carbide mating rings take advantage of unique tribological properties to improve lubricity at the interface.

Near-Zero Face Deformation Under Load with FEA-optimized robust seal face geometry ensures the lubricating film is never pinched.

Lubrication Enhancing Laser-Etched Features on the mating ring amplify film load support, which significantly improves reliability in thin fluids like light hydrocarbons and high-temperature water.

Separate Inboard and Outboard Mating Rings mechanically and thermally isolate inboard and outboard seals from each other. Safety is improved over designs with a common mating ring.



Large volume barrier fluid cavity for thermal management in high pressure applications

Stationary Design allows for high peripheral speed operation.

Unique Mating Ring Key-Drive mechanism evenly distributes drive forces and prevents point-loads, which can deformation and fracturing.

Metal-to-Metal Torque Transfer to flexible stationary element eliminates wear-induced seal hang-up.

Coated and Ground Dynamic O-Ring Surface prevents wear from fretting and ensures smooth long-term operation.