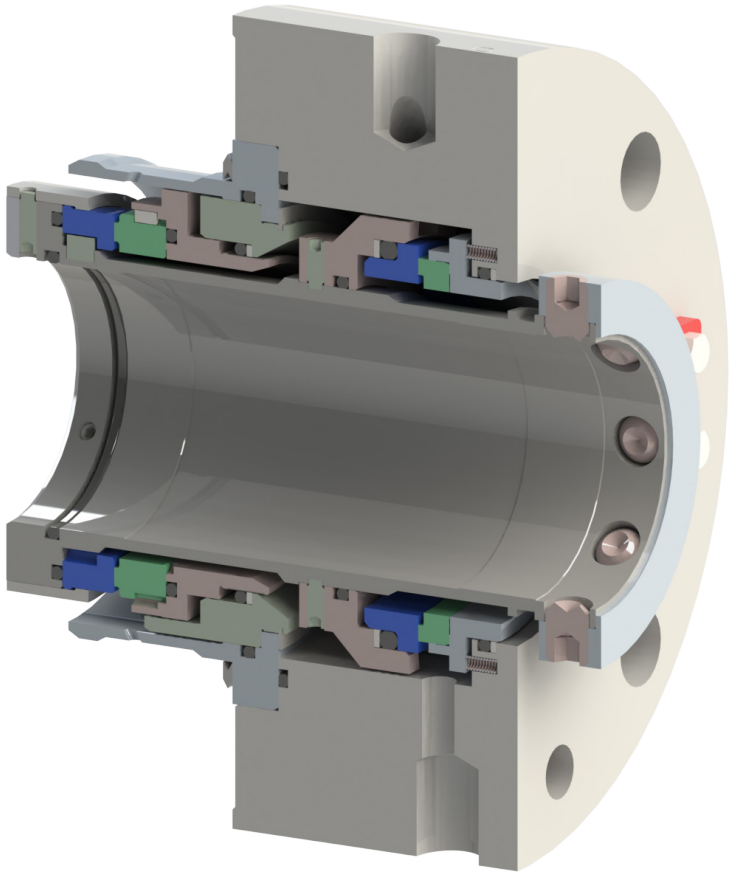
HIGH-PRESSURE TANDEM DUAL STATIONARY MULTI-SPRING CARTRIDGE SEAL

For high-pressure process duties with minimized process emissions

The **Style HPPTL** seal is designed for exceptional reliability in NGL and other light hydrocarbon applications, where a double seal arrangement is required and buffered seal support is provided from an appropriate API 682 Plan 52.

- Versatile across industries: ideal for oil and gas, petrochemical, and power generation.
- When sealing light hydrocarbons, a heavy-duty buffered double seal reduces your emissions to atmosphere and provides the security of an outboard seal in the case of an inboard failure.
- Ideally arranged for support from either API Plan 52 buffer fluid with an optional Plan 72 sweep to flare, or barrier fluid pressures up to 300 psig (20.7 bar) where one of Plans 53A/53B/53C can be used.
- High-torque, high-speed: engineered for extreme torque loads and rapid surface speeds, perfect for high-energy pumps where limited emissions are desired.

Typical Flush Plans: 52/53A/53B/53C



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 Temperature	550 °F (290 °C)
Max Inboard Pressure	2,000 psi (138 bar)
Max Speed	4,500 fpm (23 m/s)
Min Barrier Pressure Above Process	30 psi (2 bar)

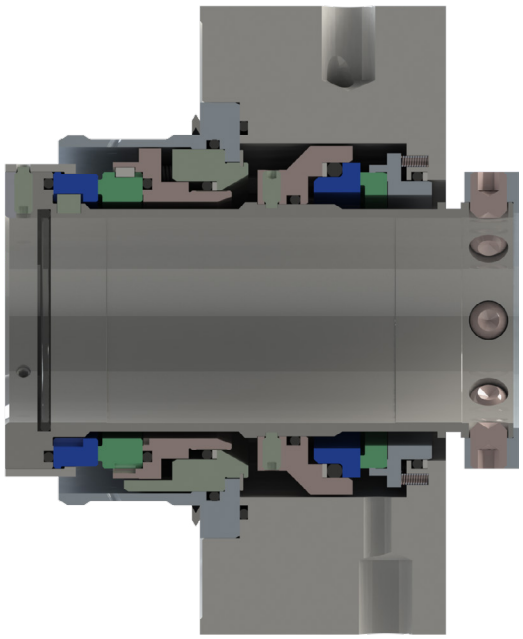
*Max temperature / pressure / speed indicate operating extremes independently and do not imply the seal will function at these extremes at the same time. Contact Flexaseal if in doubt.

TYPE A | CATEGORY 2 & 3 CONTACTING WET SEALS

Arrangement 3

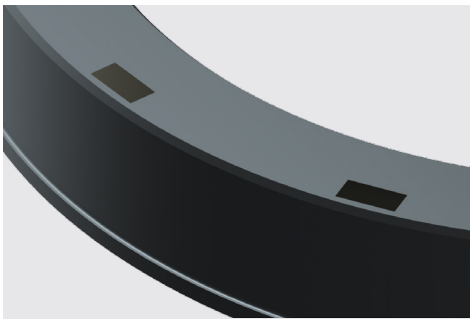
The **Flexaseal Style HPPTL** provides a robust tandem sealing solution for high-pressure processes where emissions must be minimized and comes standard with these features:

- 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.
- Robust seal rings with FEA-optimized geometry nearly eliminates seal face deformation, and maintains an optimal lubricating film.
- 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.
- Precision-ground metal seal ring support surfaces ensure face steadiness during operation.
- Metal oxide coated dynamic O-ring surfaces prevent fretting wear from process vibrations.
- High-flow pumping ring maximizes fluid circulation and heat transfer from the faces, improving thermal management and seal performance.



LASER-ETCHED LUBRICATION ENHANCEMENTS:

Engineered surface features on the mating ring improve load support, significantly increasing reliability in low-viscosity fluids such as light hydrocarbons and high-temperature water.



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DESIGN FEATURES & BENEFITS

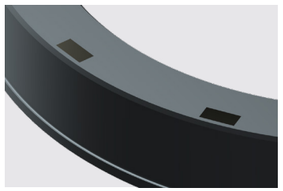
Premier Primary Ring Material FlexSiCG, siliconized carbon/graphite, combines the self-lubricating capabilities of carbon/graphite with rigidity and wear resistance of silicon carbide.

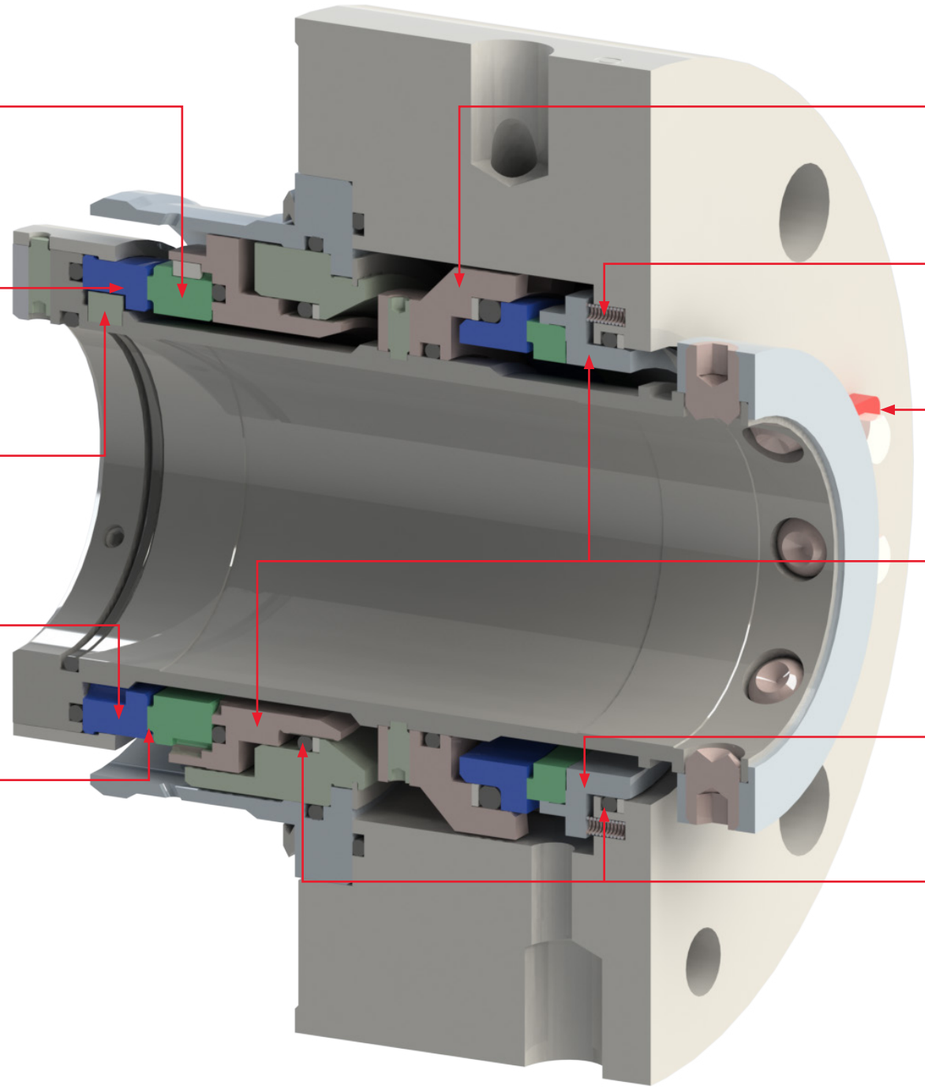
Reaction Bonded Silicon Carbide Mating Rings take advantage of unique tribological properties to improve lubricity at the interface.

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

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.





High-Flow Pumping Ring improves circulation of buffer or barrier fluid.

Outboard Springs remain clean in buffer/barrier fluid.

Large Retained Setting Clips for easy seal installation and removal setting clips are always with the seal.

Stationary Design allows for high-peripheral speed operation and enhanced runout compensation.

Shrunk-Fit Retainer strengthens carbon seal ring for high-pressure containment.

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