

DRY-RUNNING, NON-CONTACTING CONTAINMENT GAS SEALS

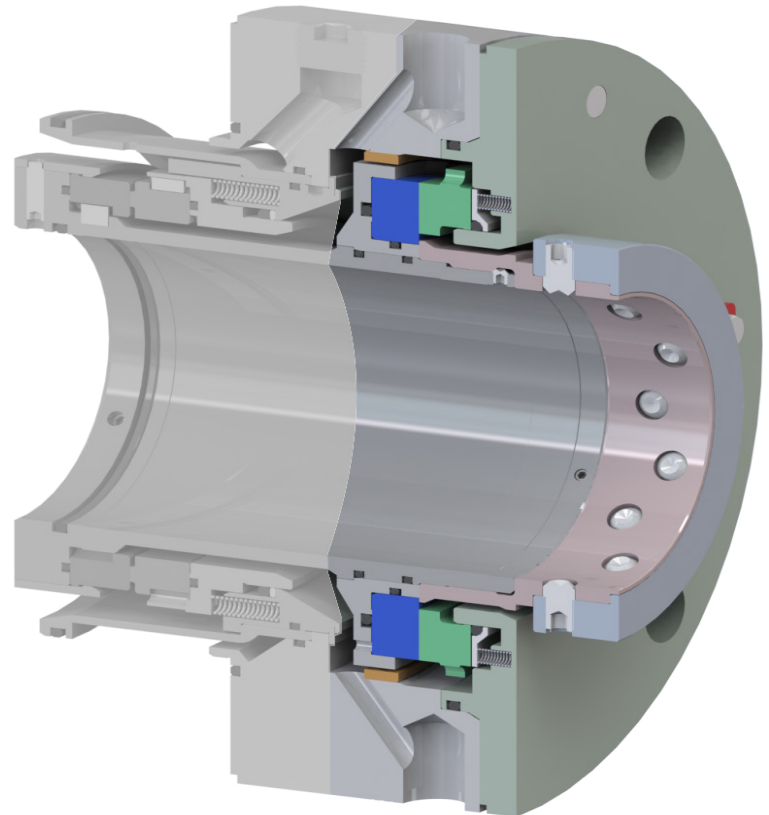
For secondary containment, minimizing process emissions and simplifying external support systems

Flexaseal Style CPH seals are non-contacting dry gas seals designed to provide secondary vapor containment and full pressure wet backup seals in high duty applications like light hydrocarbons, crude oil, and other hazardous services.

- Optimized bi-directional laser-etched liftoff patterns maintain the non-contacting gas seal, reducing wear and power consumption.
- Designed to meet stringent emissions standards for light hydrocarbons and other hazardous products when supported with Plan 72/76 vapor containment systems, directing leakage to flare.
- Functions as a backup wet seal when primary containment fails, ensuring operational safety, even under high pressure leakage.
- Can operate effectively as a single seal for blowers, turbines, and vertical sump pumps, where dry-running and low emissions are required.

COMMON APPLICATIONS

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



MATERIALS OF CONSTRUCTION

Rotary Faces	Silicon carbide
Stationary Faces	Antimony impregnated carbon/graphite
Springs	Hastelloy C-276
Metal Parts	316 stainless steel, Alloy 255, Hastelloy C-276
O. Rings	Fluoroelastomers, EPDM, TFEP, Perfluoroelastomers

OPERATING PARAMETERS

Max Temp	250°F (121°C)
Typ. Operating Pressure	0 - 15 psi (0 - 1 bar)
Max Containment Pressure	1,500 psi (103 bar)
Max Speed	6,000 FPM (30.5 m/s)

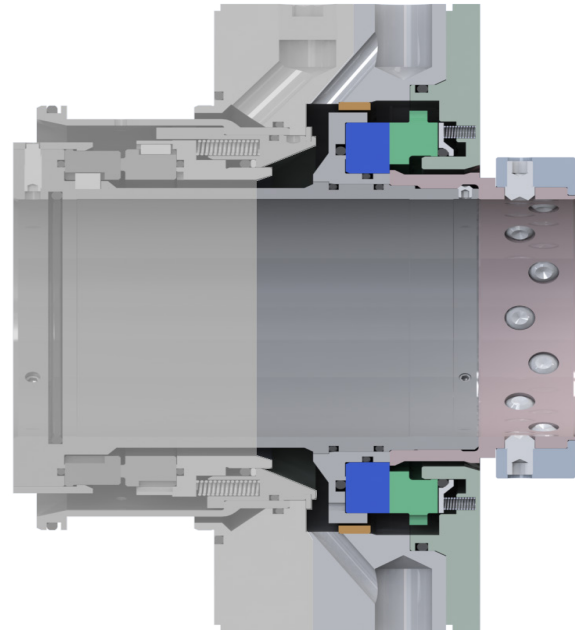
Max Temperature / pressure / speed indicate operating extremes independently and do not imply the seal will function at these extremes at the same time. Contact Flexaseal if in doubt.

TYPE A | CATEGORY 2/3 NON-CONTACTING DRY SEALS

Arrangement 2

The **Flexaseal Style CPH** addresses the challenges of sealing high pressure process fluids with low specific gravities by provide a safe and effective secondary non-contacting gas seal. The seal design is highly adaptable to meet specific application needs and comes standard with:

- High duty seal face materials.
 - Antimony impregnated carbon/graphite primary rings are robustly designed to contain high-pressure leakage in the event of inboard seal failure.
 - Sintered silicon carbide mating rings.
- Precision laser-etched face topography separates the seal faces ensuring non-contacting operation as a secondary seal.
- Canted coil springs center sensitive components for smooth operation.
- Two-piece sleeve design withstands extreme thrust loads for reliability under strain.
- Ultra-polished dynamic O-ring surfaces and backup ring design minimize drag for fast responses to changing conditions.
- Stationary design allows for high-peripheral speeds



Style CPH seals can be configured with optional support features to meet application specific requirements, including:

- Plan 72 – buffer gas sweep of inner seal leakage dilutes emissions to atmosphere
- Plan 75 – condensing leakage collection system redirects inner seal leakage away from the containment seal
- Plan 76 – non-condensing leakage vapor collection system (e.g. vent to flare) redirects inner seal leakage away from the containment seal

The Style CPH leakage containment solution can be incorporated to the following seal styles:

- Style HPPS
- Style 58A
- Others, as developed

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DESIGN FEATURES & BENEFITS

Premier Primary Ring Material antimony impregnated carbon/graphite primary rings are robustly designed to contain high-pressure leakage in the event of inboard seal failure.

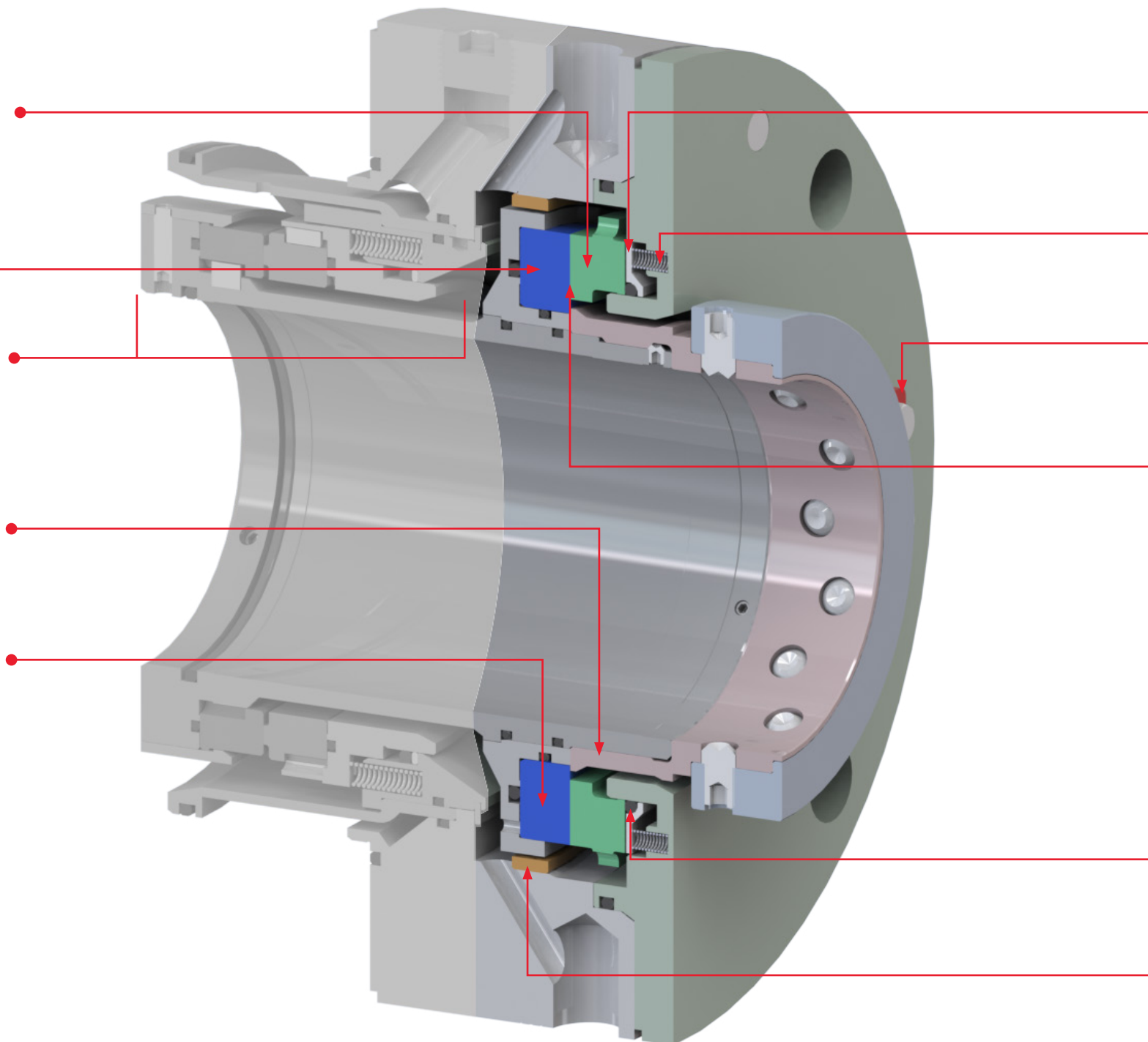
Sintered Silicon Carbide mating rings

Adaptable to API Single Seals as a leakage containment and backup seal solution.

Flexaseal Style HPPS shown here.

Two-Piece Sleeve design withstands extreme thrust loads for reliability under strain.

Near-Zero Face Deformation under load with FEA-optimized robust seal face geometry.



High Peripheral Speeds are achievable with robust stationary design.

Canted Coil Springs center sensitive components for smooth operation

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

Precision Laser-Etched Grooves generate bi-directional liftoff in the sealing interface, ensuring non-contacting operation at low pressures. Liftoff pad geometry allows for the gas to enter, build pressure/liftoff, and exit, reducing overall gas consumption.



Ultra-Polished Dynamic O-Ring Surfaces and backup ring design minimize O-ring parasitic drag for a fast seal response to changing conditions

Fixed Clearance Bronze Containment Bushing isolates the CPH seal from vent and drain ports when a buffer gas is used to dilute process emissions.