

GTS Seal for Steam Turbines



The most reliable steam seal in the industry, designed for real world applications.

The **GTS** steam seal - a **simple design** for easy retrofits of existing

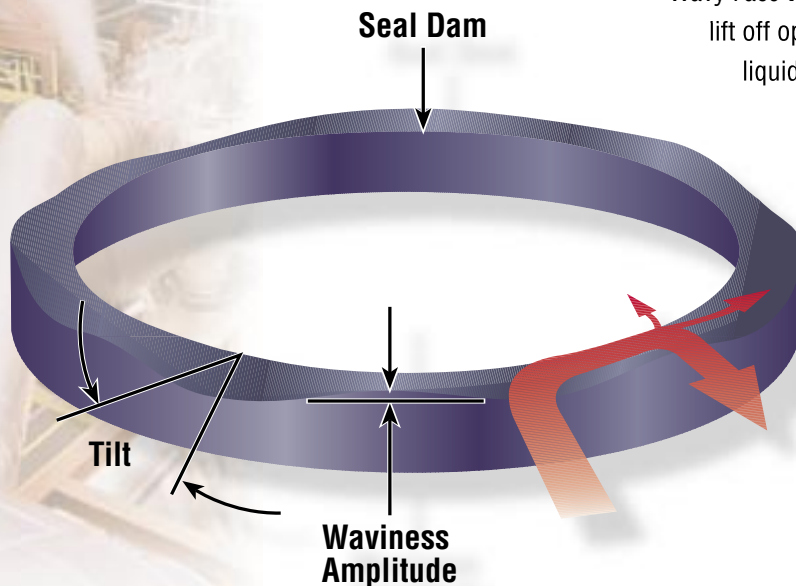
The advanced GTS is designed to handle real world steam applications to provide real benefits of a mechanical seal in sealing steam turbines.

Conventional dry gas seals applied to steam turbine applications can fail prematurely due to clogging of grooved face patterns, sleeve distortions, and hang-up problems of dynamic secondary sealing elements.

Flowserve expended considerable effort developing a mechanical seal that is especially designed for steam turbine applications. The result is the GTS, providing the real benefits of a mechanical seal in sealing steam turbines such as:

- Significant energy savings
- Virtually no contamination of bearing oil resulting in enhanced MTBF of the turbine
- Elimination of hazardous “steam clouds” which improves plant safety

Superior Wavy Face¹ Technology



Wavy Face technology gives a mechanical seal non-contacting lift off operation in real world applications yet can also seal liquids under upset conditions.

- Able to recover from upset conditions because there are no conventional face grooves to clog.
- The Wavy Face design incorporates a positive sealing dam that operates without face contact, hence, no wear.
- Bi-directional operating capability improves interchangeability and reduces installation and operation errors.

Bellows design helps eliminate secondary seal problems

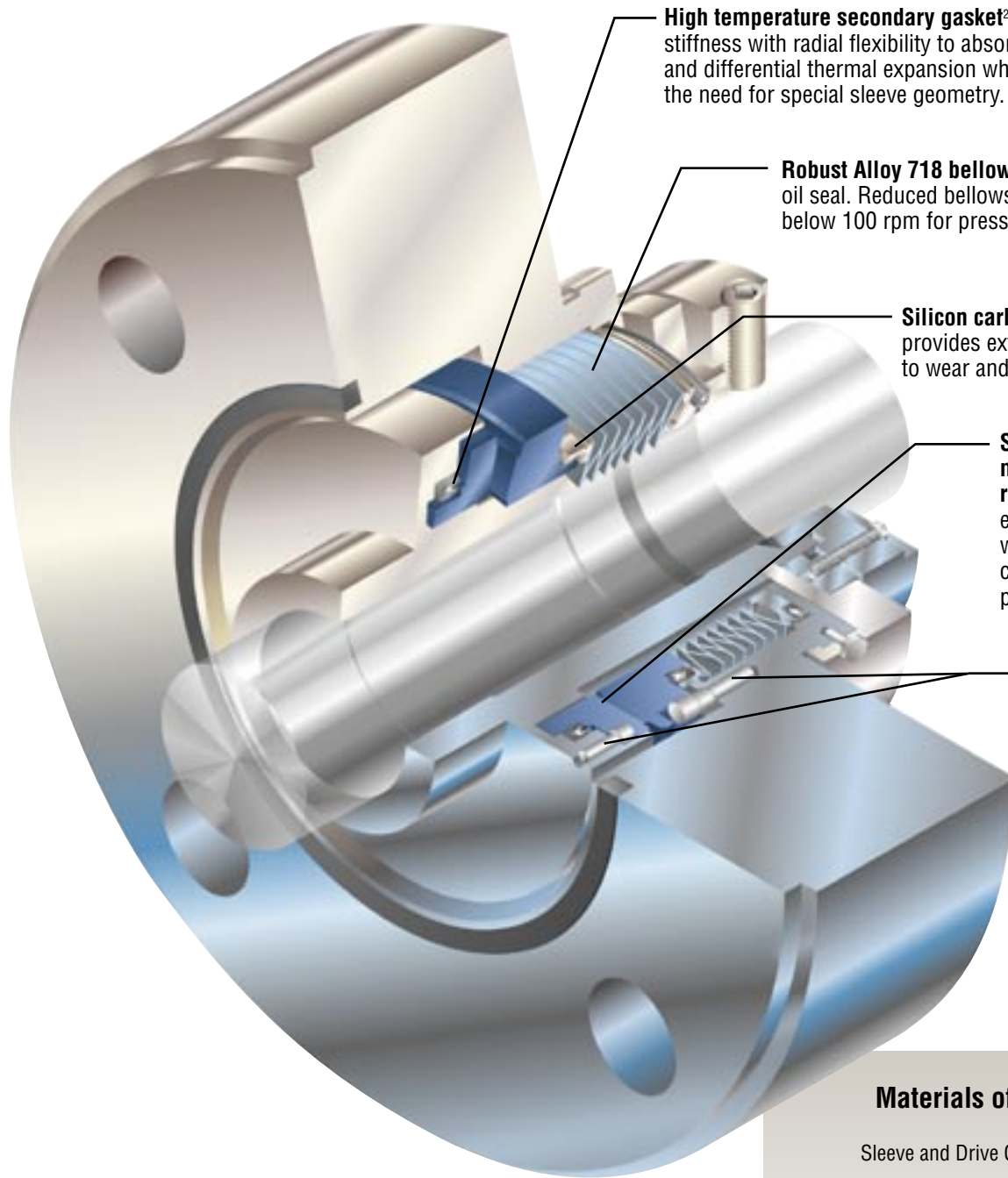
GTS Inconel bellows helps eliminate dynamic secondary sealing element hang-up problems traditionally experienced in lightly loaded pusher seal designs.

Available as both internally and externally mounted designs



¹ U. S. Patent numbers 4,836,561 & 4,887,395 with others pending

steam turbines with **no** or **minimum** equipment modification



High temperature secondary gasket² provides high axial stiffness with radial flexibility to absorb thermal distortion and differential thermal expansion which helps eliminate the need for special sleeve geometry.

Robust Alloy 718 bellows based on the BXRH hot oil seal. Reduced bellows load allows slow roll below 100 rpm for pressures of 50 psig or above.

Silicon carbide stationary face provides extraordinary resistance to wear and erosion.

State of the art laser machined silicon carbide rotating face provides extremely tight tolerance wave geometry and consistent, repeatable and predictable performance.

Robust pin drives with rounded heads prevent chipping.

Materials of Construction

Sleeve and Drive Collar 416 Stainless Steel

Flange 416 Stainless Steel

Rotating Face Silicon Carbide

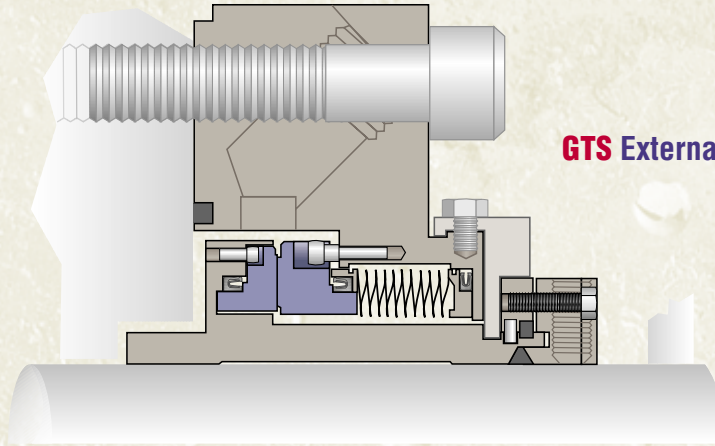
Stationary Face Silicon Carbide

Seat Gasket / Rotating Face Gasket Composite

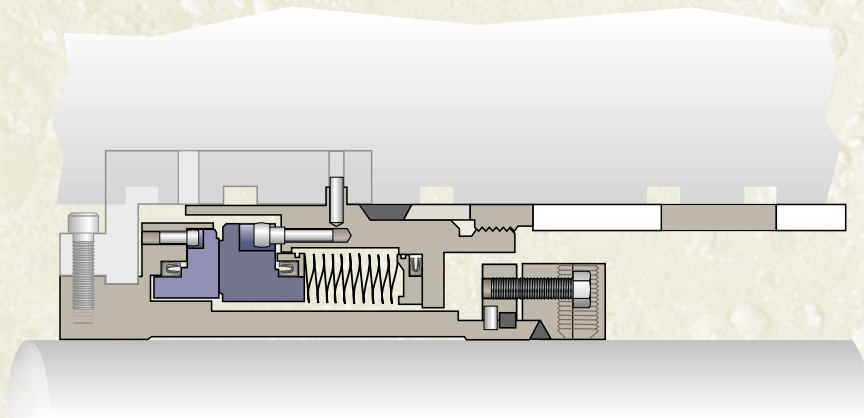
Bellows Assembly Alloy 718

Labyrinth Bushing (optional) Carbon or Aluminum (depending on design)

Industry, designed for real world applications.



GTS External Mount Arrangement



GTS Internal Mount Arrangement

Technical Information and Operating Parameters

Products	Steam (saturated and superheated) Hot Condensate
Maximum Speed	7000 rpm higher speeds with approval of Flowserve Technical Services
Minimum Slow Roll Speed	10 fps (3 m/s) less than 100 rpm at 50 psig or greater
Seal Chamber Pressure	0 - 300 psi (0 - 20 bar)
Seal Chamber Temperature	650°F (343°C)

Standard Sizes

Basic Seal	Max Shaft
2875	2.375" (60.3mm)
3250	2.750" (69.8mm)
4125	3.500" (88.9mm)
5000	4.375" (111.1mm)

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