

GTSP

High temperature pump gas seal

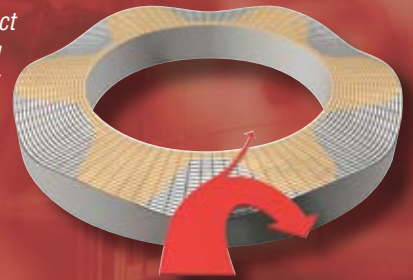
GTSP seals are dual pressurized, high temperature metal bellows gas seals for the hottest process pumps found in refinery and hydrocarbon services. Utilizing Flowserve's exclusive bi-directional wavy face topography, GTSP seals pressurized with dry steam or nitrogen are specially engineered to drive exceptional, long-term equipment reliability and lower energy consumption.

Features Precision Face Topography

Wavy face technology separates the seal faces so there is no seal face wear

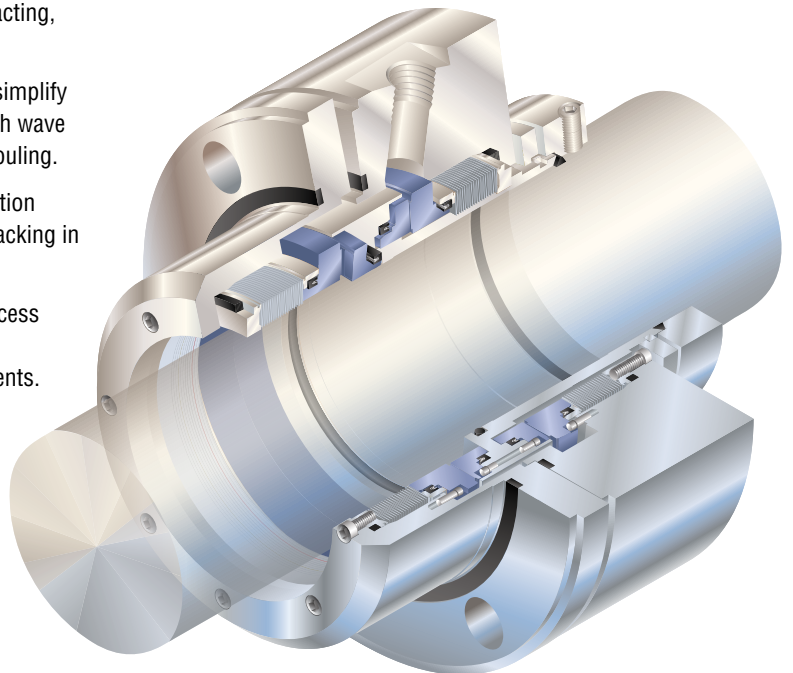
Recirculation effect minimizes fouling for high reliability

Low gas consumption and low speed lift-off



Features and Benefits

- Dual pressurized gas seal design eliminates process leakage and coking problems in a compelling economic design that avoids liquid barrier-related seal issues.
- Laser-applied wavy face technology creates a gas film barrier between the seal faces to provide non-contacting, low drag, low energy consumption performance.
- Sinusoidal waves allow bi-directional operation to simplify installation on double-ended pumps and the smooth wave texture is self-cleaning to resist contamination or fouling.
- Alloy 718 welded metal bellows assembly construction offers the highest resistance to stress corrosion cracking in high temperature, sulfuric-laden services.
- Designed to operate without cooling and at full process temperature, the cartridge seal tolerates high axial overtravel during pump warm-up or thermal transients.
- Patented spring-energized graphite (SEG) seals absorb differential thermal expansion to maintain flat seal faces and low steam leakage rates.
- Qualification tested per API 682 Type C requirements for 3NC-FF designs, GTSP seals are suited for hot hydrocarbons such as hot oils, gas oils, asphalt and heat transfer fluids.



Operating Parameters

Process Pressure	Up to 250 psi (19.0 bar)
Barrier Pressure	Up to 300 psi (20.7 bar)
Temperature	Up to 800°F (427°C)
Surface Speed	Up to 150 fps (46 m/s)
Shaft Sizes	2.000 to 4.125 inch (50.8 to 104.8 mm)

Materials of Construction

Bellows Assemblies	Alloy 718
Rotating Faces	Silicon Carbide
Stationary Faces	Silicon Carbide
Gaskets	Flexible Graphite
Metal Components	316 Stainless Steel, Alloy C-276 416 Stainless Steel

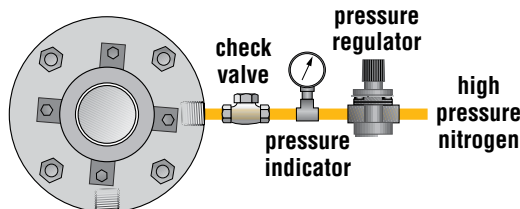
GTSP seals are easier to install and maintain than liquid barrier seals and operate at a fraction of the energy cost.

Wavy face GTSP gas seals eliminate the energy requirements from circulating, cooling and churning a liquid barrier along with significantly less heat generation and torque at the seal faces. Liquid dual seals consume at least 10 times more energy than GTSP seals, not including liquid seal costs associated with barrier fluid maintenance or an inboard seal flush. A plan 74 pressurized supply system simply injects clean gas dead-ended into the GTSP barrier port. Dry steam is a first choice in hot hydrocarbon services and a reliable supply is typically available nearby, simplifying setup time with minimal connection expense.

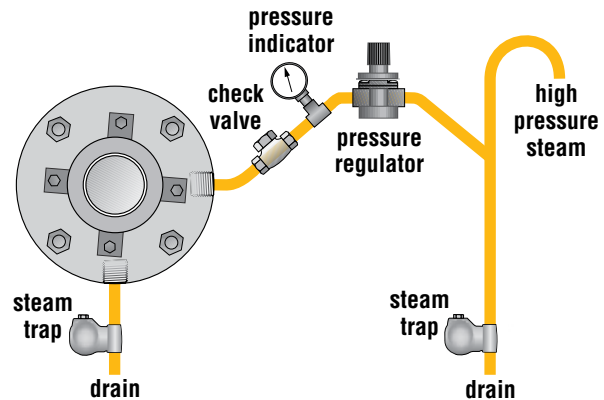
Contact Flowserve for expert technical support on the design, installation and operation of GTSP gas barrier seals and systems.

Plan 74 Minimum System Requirements

Nitrogen Barrier



Steam Barrier



FSD241eng ORG 04-09 Printed in USA

To find your local Flowserve representative
and find out more about Flowserve Corporation
visit www.flowserve.com

USA and Canada

Kalamazoo, Michigan USA
Telephone: 1 269 381 2650
Telefax: 1 269 382 8726

Europe, Middle East, Africa

Essen, Germany
Telephone: 49 201 31937-0
Telefax: 49 201 2200-561

Asia Pacific

Singapore
Telephone: 65 6544 6800
Telefax: 65 6214 0541

Latin America

Mexico City
Telephone: 52 55 5567 7170
Telefax: 52 55 5567 4224

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.