

APPLICATION SOLUTIONS: **PROCESS STEAM TURBINES**

# Significantly Extend MTBR & Increase Steam Savings with a Drop-In Replacement Floating Brush Seal.

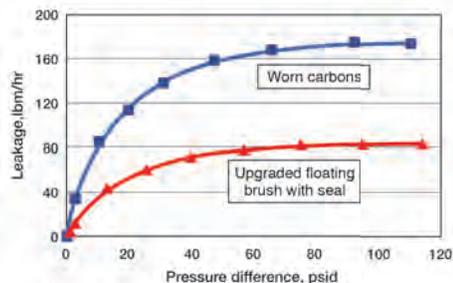
Carbon seals, the traditional sealing method in process steam turbines, are weak, brittle, and wear quickly—causing them to become ineffective within a short period of time. Ineffective sealing solutions decrease reliability and efficiency by requiring periodic seal replacements and causing an increase in steam leakage.

Enhance the performance of your process steam turbines by protecting the carbon rings with the Inpro/Seal® Sentinel® Floating Brush Seal (FBS). The Sentinel FBS is comprised of densely packed and flexible metallic bristles which “bend” with changing clearances between rotating and stationary surfaces. This unique technology, first applied in jet engines where high temperature differentials demand the need for a compliant and reliable seal, provides an extra layer of protection that slows down the natural wear of downstream carbon rings.



The Sentinel FBS is intended to be a drop-in replacement for a standard carbon ring seal. The brush serves as the primary shaft seal while a carbon element provides face sealing in the turbine’s casing. Users have found that by utilizing the FBS, the interval between seal replacement increased more than 3x to an average 3 to 4 year life span.

Count on us to deliver enhanced performance on your process steam turbines by increasing MTBR and efficiency through an effective sealing solution.

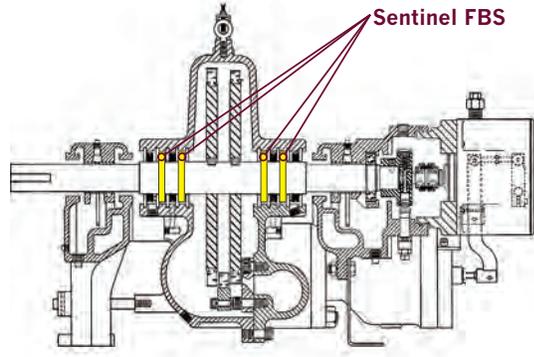
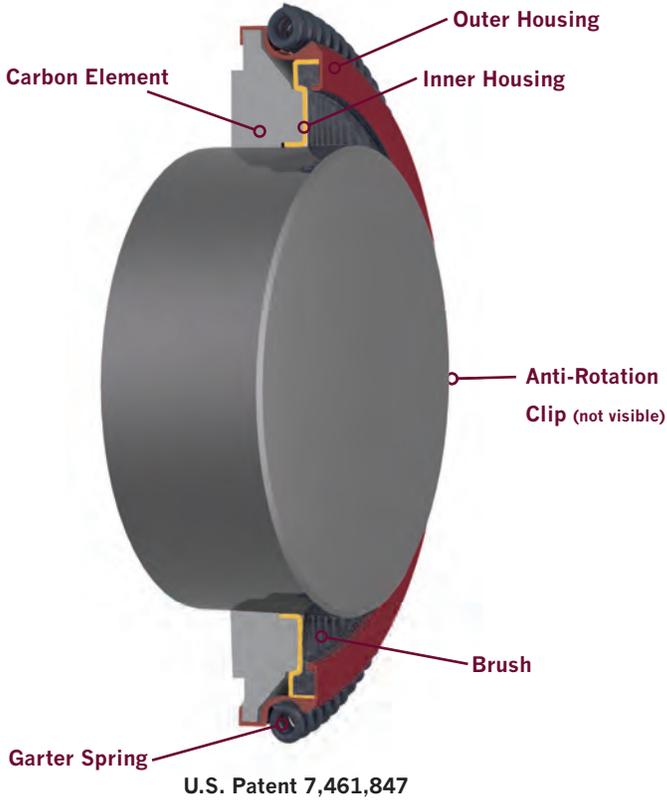


## FACTS AT A GLANCE

The Sentinel® FBS installed on process steam turbines:

- protects downstream carbon rings from contamination and high pressure.
- reduces maintenance, downtime and steam loss.
- prevents secondary damage to bearings and leakage to atmosphere .
- is a Plug-n-Play split design without necessitating rotor removal or costly casing modifications.
- provides predictable leakage (low and stable) over an extended operating life compared to carbon rings.
- is self-centering and lightweight.
- utilizes a compliant brush seal that allows “wear-in” to optimize fit and eliminates incorrect bore sizing issues.
- is backed by a 2 year extended product warranty.





## SENTINEL® FBS Operating Parameters

**Pressure:** Up to 150 psid [10 bar]

**Temperature:** Up to 850°F [450°C]

**Surface Speed:** Up to 160 ft/sec [50 m/s]

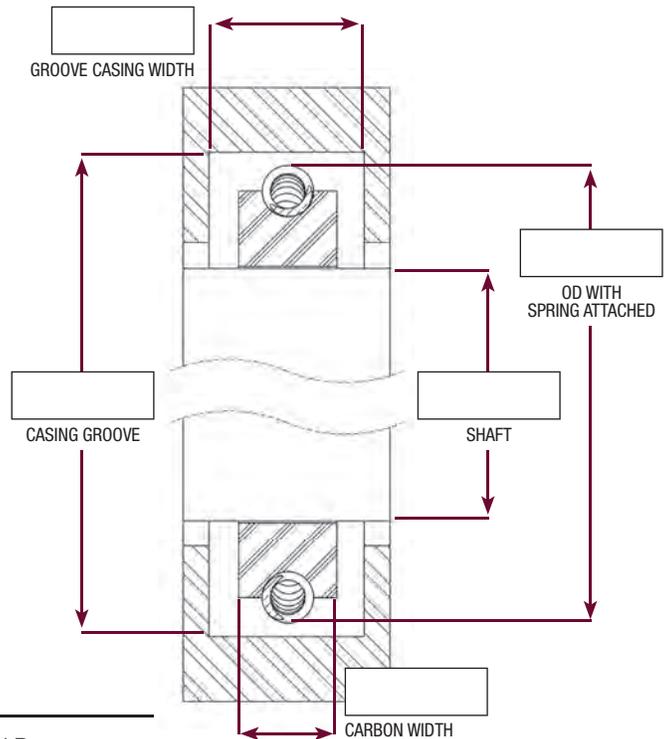
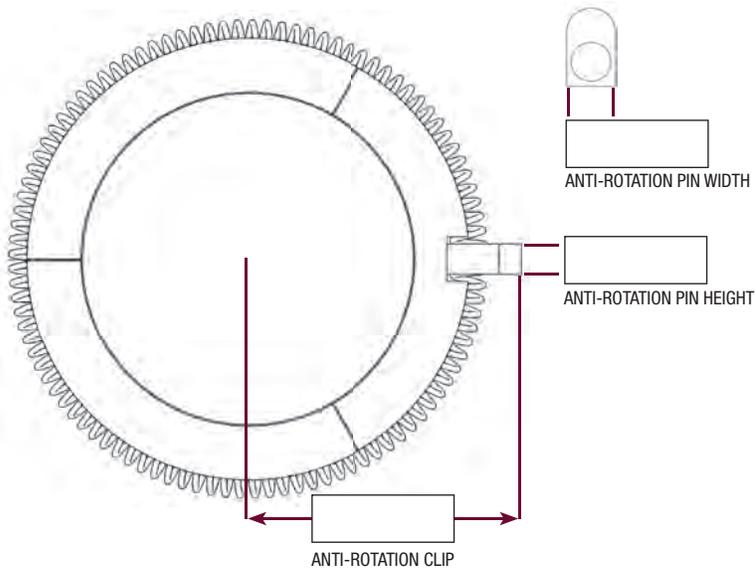
**Environment:** Steam

## Available Designs

Elliott (YR turbines), Turbodyne, Terry, Coppus, Skinner, Worthington & Murray. Other designs available upon request.

## SENTINEL FBS REQUEST FOR QUOTE

### EXISTING CARBON RING & GLAND BOX SURVEY



### TURBINE EXHAUST CONDITIONS

Steam Flow: \_\_\_\_\_ # of Carbon Rings in Steam End Gland Box: \_\_\_\_\_  
 Pressure: \_\_\_\_\_ # of Carbon Rings in Exhaust End Gland Box: \_\_\_\_\_  
 Temperature: \_\_\_\_\_  
 Shaft Speed: \_\_\_\_\_ Turbine Make: \_\_\_\_\_ Turbine Model: \_\_\_\_\_  
 Shaft Material: \_\_\_\_\_ Customer Name: \_\_\_\_\_

### CUSTOMER INFORMATION