SPLIT SEALS

SOLUTIONS FOR LARGE ROTATING EQUIPMENT

PUMPS, MIXERS, AGITATORS, PULPERS, REACTORS, AND WATER TURBINES

CHESTERTON®
Global Solutions, Local Service.

Conventional sealing for large equipment

Equipment damage leads to increased production downtime

Large centrifugal pumps are typically sealed with mechanical packing due to the overall pump size, shaft size, and lack of other viable sealing devices.

Conventional packing materials can cause shaft wear which increases process leakage. Process leakage can lead to premature bearing failure and component and equipment corrosion. This leads to unnecessary downtime to replace bearings, shaft sleeves, and other equipment damage.

There are also safety and biohazard risks associated with process leakage.

Unscheduled downtime and loss of production can be caused by conventional sealing methods.

Leakage leads to equipment corrosion and premature bearing failure

Conventional sealing can often lead to:

- Sleeve wear
- Excessive leakage
- Premature bearing failure
- Collateral equipment damage
- Downtime and production loss
- Increased operating costs

Chesterton® split seals... A better solution

No equipment teardown, easy-to-install, high performance

Chesterton's split seals are designed to seal without process leakage, minimizing the problems associated with it. Our innovative technology has expanded split seal use in large process equipment, thus simplifying installation, improving reliability at start-up, and extending performance capabilities.

Chesterton specialists work closely with process operators to better understand the causes of system failures. By understanding system dynamics, Specialists can combine split seal design with operation knowledge to develop a more reliable, cost effective sealing solution for your large rotating equipment.

Effluent pumps, sealed with 8.00 inch (200 mm) diameter split seals, have been in service for over 12 years.

Split seal installation and repair are completed without equipment disassembly, saving time and operating costs.

Why use Chesterton split seals?

- Eliminate equipment teardown and the associated downtime
- Easy installation
- Leak-free technology
- No packing maintenance or break-in requirements
- Reduce or eliminate flush water usage
- Proven technology for years of reliable operation
- Reduce maintenance and operating costs
- Field repairable

SPLIT SEAL SOLUTIONS

Chesterton, your partner in *total sealing solutions*

Our knowledgeable specialists, engineers and service teams will listen and work with you to deliver the best *total sealing solutions* for your critical process equipment. By understanding the dynamics of your process and individual needs, Chesterton will help you develop successful long-term sealing solutions that meet those needs.

442 Split Seal

Chesterton split seal advantages

- Performance capabilities allow the largest range of applications
- Innovative technology geared towards enhanced reliability
- Easy to install and simple to field repair—no glued components
- Versatile to fit more equipment
- Extensive installation experience
- Largest global installed base
- Available in sizes to 36 inches (915 mm)
- Standard pressure capabilities to 150 Psig (10,3 bar g)

Engineered to your application

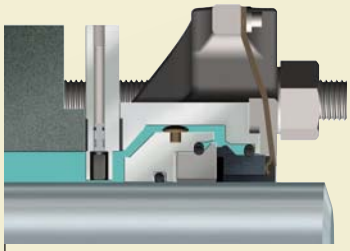
Chesterton's innovative split seals are designed to fit the broadest equipment and application base for the industries we serve. If your requirements are not met by our standard split seal designs, our team of engineers can develop an engineered solution to meet them.

Environmental controls and secondary sealing

Environmental controls and secondary sealing devices play an important role in achieving reliable, long-term split seal operation. Chesterton utilizes advanced sealing technology to provide a *total system solution* that focuses on the process fluid, application criticality, equipment type, pressure and vacuum fluctuations, as well as seal water availability.

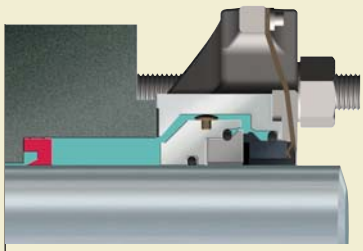
High particulate content in water can reduce seal reliability and performance by causing erosion or seal clogging. Seal water can be injected into the seal at a higher pressure than the process fluid to keep the seal free of particulates. Where seal water is unavailable or intermittent, seal reliability is impacted. SpiralTrac™ technology can significantly reduce or, in many cases, eliminate the need for flush water.

Chesterton can integrate split seal technology, secondary sealing devices, and environmental controls to optimize system reliability and reduce your total costs.



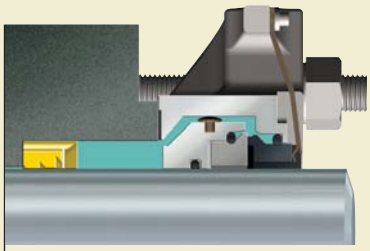
442 Split Seal with ISS Safety Seal

ISS Safety Seal is a static sealing device that allows the removal of the split seal during shutdown periods without the need of draining tanks or process equipment.



442 Split Seal with 14K

Chesterton's 14K Seal has the unique ability to isolate the stuffing box environment for tough slurry applications. Intermittent back flows due to process fluctuations are minimized due to the 14K's sealing actuation.



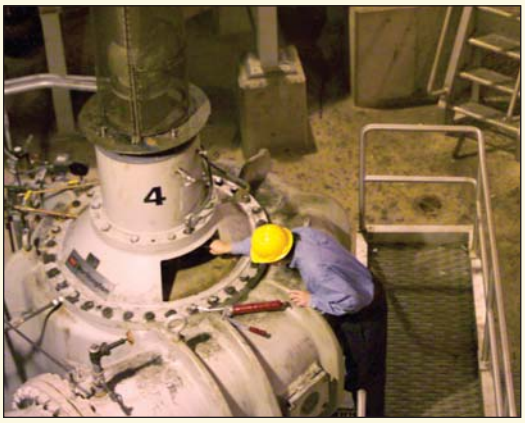
442 Split Seal with SpiralTrac™

SpiralTrac environmental controllers enhance the stuffing box/seal cavity environment by removing entrapped air and particulates from the process fluid, eliminating two potential sealing device failure modes.

APPLICATION SOLUTIONS

Chesterton, the global leader in split seal technology

Chesterton split seals have been used to seal thousands of process-critical pieces of equipment with exceptional results and many years of leak-free operation. Split seal use has gained wide acceptance in large rotating equipment with a much broader application base.



Wastewater, *United States*

Equipment: 8 Influent pumps, 400 rpm at 45 Psig (3 bar g)

Fluid Sealed: Wastewater

Problem: Packing leakage caused equipment damage and safety concerns.

Solution: 8.5 inch (215 mm) split seal with reduced flush has been in service over 10 years, leak and maintenance free.

Thermal Power, *Australia*

Equipment: 5 Cooling water pumps, 900 rpm at 100 Psig (7 bar g)

Fluid Sealed: Raw water

Problem: Packing leakage caused equipment damage and bearing failure requiring unscheduled downtime and replacement.

Solution: 11.75 inch (300 mm) split seal eliminated water leakage associated problems. The first seals have been in service for over 9 years.

Industries and equipment currently sealed with Chesterton split seals include:

Water and Wastewater
- Influent and effluent pumps
- Pumping station pumps
- Raw water pumps

Hydropower
- Water turbines—main shaft
- Pumped storage pumps and turbines

Thermal Power
- Main circulating water pumps
- Cooling tower pumps
- Water intake pumps

Hydropower, *United States*

Equipment: 12 MW water turbine, 100 rpm at 30 Psig (2 bar g)

Fluid Sealed: River water

Problem: Main shaft vibration problems accelerated packing leakage to an unacceptable level.

Solution: 24 inch (610 mm) split seal eliminated water leakage, the constant packing maintenance and pen stock pumping required. Seal has been in service for over 7 years.

Wastewater, *Singapore*

Equipment: 10 Influent pumps, 495 rpm at 4 bar g (60 Psig)

Fluid Sealed: Wastewater

Problem: State-of-the art facility wanted a sealing solution that eliminated process leakage, shaft wear and other equipment damage.

Solution: 280 mm (11 inch) split seals have been used since start-up, 3 years ago, without leakage.

Pulp & Paper, *Japan*

Equipment: Bottom entry pulper, 150 rpm at 1 bar g (15 Psig)

Fluid Sealed: Paper stock,14% solids

Problem: Packing leakage into the gear box and bearings led to oil contamination and premature failure; MTBF was 3 months.

Solution: 220 mm (8.25 inch) split seal has operated without leakage for over 2.5 years.

Chemical and Pharmaceutical
- Side entry mixers and agitators
- Top and side entry reactors

Pulp and Paper
- River water intake pumps
- Side entry mixers and agitators
- Bottom entry pulpers
- Screw feeders

Marine and Navy
- Stern tubes

GLOBAL SOLUTIONS, LOCAL SERVICE

Since its founding in 1884, the A.W. Chesterton Company has successfully met the critical needs of its diverse customer base. Today, as always, customers count on Chesterton solutions to increase equipment reliability, optimize energy consumption, and provide local technical support and service wherever they are in the world.

Chesterton's global capabilities include:

- Servicing plants in over 100 countries
- Global manufacturing operations
- More than 500 Service Centers and Sales Offices worldwide
- Over 1200 trained local Service Specialists and Technicians

Visit our website at
www.chesterton.com

Chesterton ISO certificates available on www.chesterton.com/corporate/iso

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FORM NO. EN22283

PRINTED IN USA 10/09