

# HYDROPOWER

INDUSTRY SOLUTIONS





# Solutions

## That Increase Reliability and Reduce Costs

*Chesterton® is a global manufacturer of industrial fluid sealing systems, industrial coatings, lubricants, and maintenance specialties. Working with hydropower plants around the world, we have gained knowledge and expertise that continue to help us to develop unique solutions to address the specific challenges faced by the hydropower industry including fluid containment, corrosion and wear control, and critical plant assets management.*

### Chesterton's solutions and services help the hydropower industry deal with:

- Fluid leak reduction and elimination
- Environmental compliance
- Plant availability and reliability
- Reducing costs and management of critical plant assets
- Knowledge and expertise that drive results

Chesterton's unique portfolio of solutions and decades of experience, helps plants drive significant improvements in equipment availability and reliability.



### Chesterton's unique solutions

#### Reduce leakage and protect the environment

- Turbine's main shaft
- Hydraulic, pneumatic, and oil systems
- Auxiliary equipment including pumps, valves, and flanges

#### Protect, restore and upgrade

- Metal components and structures
- Concrete structures

#### Optimize reliability and maintenance activities

- Assembly, disassembly, and lubrication
- Equipment life extension



# Sealing Solutions to Improve Performance

## Turbine Main Shaft Sealing

### Split Mechanical Seals

Chesterton split mechanical seals for turbine main shafts are designed to seal without external leakage under appropriate operating conditions and to significantly reduce water filtration dependency. This innovative technology simplifies installation, improves reliability, and helps to extend performance capabilities.

- Designed to seal without external leakage
- Reduces the need for fine filtration
- Extends seal life and reliability



### Rotary Live Load

Chesterton's rotary live load system is a technology that extends the time between packing adjustments by adding energy and preload to the gland bolting system. This technology consists of springs, washers, and guides that maintain sufficient gland load on the packing set over designed travel.

- Enhances safety by minimizing the frequency of packing adjustments while the equipment is in operation
- Reduces leakage by maintaining gland load
- Improves packing life reliability



### SpiralTrac™

The SpiralTrac "active bushing technology" is an engineered bushing that controls the internal stuffing box fluid environment. Designed to work with Chesterton mechanical seals and packing, this technology works with the flow that exists inside the stuffing box to remove solids and improve sealing system reliability.

- Reduces the vast majority of the solids entering the seal area
- Multiple configurations to fit specific application requirements
- Improves operating performance of both packing and mechanical sealing systems



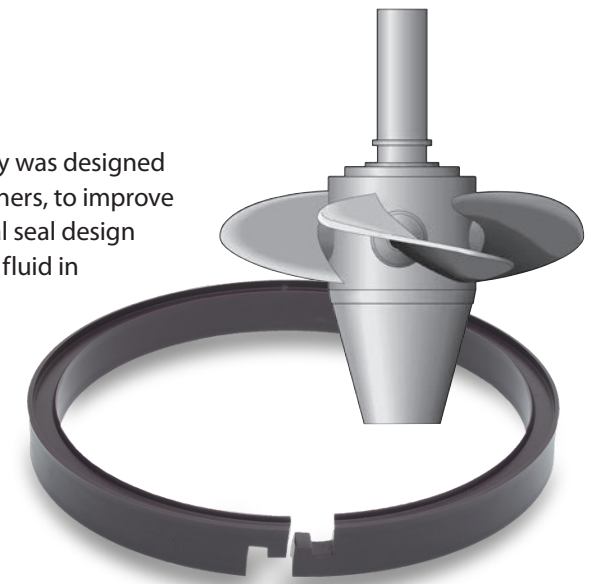
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## Hydraulic Equipment Sealing

### Kaplan Blade Runner Seals

Chesterton's innovative split, interlock, polymer sealing technology was designed for use in blade pitch control systems, found in Kaplan turbine runners, to improve reliability and minimize environmental concerns. The bi-directional seal design allows for precise positioning of blades while sealing the hydraulic fluid in and river water out.

- Interlock design seals oil in and water out
- Proprietary low friction polymer enables accurate blade positioning
- Split design minimizes turbine downtime and maintenance costs



### Polymer Seals for Wicket Gates

Chesterton sealing experts have developed tailored sealing solutions, for wicket gate cylinders, that provide long-term reliability. Our abrasion-resistant polymer materials with robust designs that accommodate these slow, rotary, oscillating equipment conditions are ideal for use in cold water service.

- High-integrity, reliable sealing for slow, rotary, oscillating applications
- Unique designs eliminate continual adjustments
- Durable polymer material compensates for equipment variations
- Proven life and reliability extensions



### Custom Solutions — SpeedSeal® Centers

Whether your application requires a split or solid seal design for high-pressure, reciprocating or slow, rotary actuation, Chesterton offers proven polymer sealing solutions to meet your needs. Our regional SpeedSeal manufacturing and engineering centers enable us to provide same-day service for virtually any design, material, or size.

- Servo motor cylinders
- Blade pitch, brake, and jack cylinders
- Butterfly, spherical, and ball valves
- Shaft bearing seals





# Solutions to Optimize Reliability

## Equipment Protection



### ARC Efficiency and Protective Coatings Technology

ARC industrial coatings offer effective solutions for protecting and rebuilding plant metal and concrete infrastructure and equipment that is subjected to corrosion, wear, and environmental damage. ARC low-VOC, 100% solids, protective coatings are engineered to offer long-term protection to hydro station components and equipment including:

- Trash racks and stop logs
- Penstocks and valves
- Turbine components
- Spillways
- Concrete structures

### ARC Metal Coatings

Prolonged exposure to corrosive fluids and abrasive particulates erodes unprotected metal surfaces, impacting plant reliability and costs. ARC Metal Coatings are formulated to protect equipment and structures providing years of service under the harshest conditions.

- Ceramic-reinforced claddings for abrasion and impact
- Rebuilding compounds to repair worn equipment
- Sprayable barrier coatings for corrosion protection and flow efficiency improvements

### ARC Concrete Coatings

Concrete is used throughout a hydropower plant and is prone to damage and attack as a result of operating in the environment. ARC Concrete Coatings are utilized to repair damaged concrete surfaces and protect them against further attack.

- Primers and sealers to reduce permeation and improve adhesion
- Grouts to rebuild and resurface
- Protective coatings and linings to reduce corrosive attack and abrasive wear



## Equipment Reliability

### Auxiliary Equipment Sealing

Plant and auxiliary pumps, valves and flanges are just as critical to the power production process as the station's turbines. Chesterton offers a complete line of sealing solutions for this equipment including:

- Mechanical seals for pumps
- Mechanical packings for pumps and valves
- Flange sealing products from sheet gasket materials to semi-metal gasket solutions



## Maintenance Solutions

### Industrial Lubricants and Maintenance Specialty Products

Chesterton formulates and manufactures a wide variety of products and solutions specifically suited to the hydropower plant environment. State-of-the-art technologies in lubrication, cleaning, degreasing, and corrosion control provide multiple options to maintain a safe, clean, and reliable plant environment while enhancing maintenance activities.

- Improve bearing performance with QBT™ Quiet Bearing Technology
- Maximize wire rope and cable performance
- Extend and optimize chain life



# Chesterton Proven Solutions are supported by:

## Engineering Support and Consultation

Chesterton creates tailored industrial seal designs that integrate innovative technologies to provide a distinct competitive advantage in your marketplace. Our team incorporates seal engineering expertise, industry and process knowledge using state-of-the-art analytical tools, and testing to solve some of the most complex industry challenges.



## Training

Chesterton's experienced factory-trained personnel and partners are located in over 100 countries around the world and provide specific assistance for your equipment challenges. We work closely with our customers to help them achieve higher levels of equipment reliability, efficiency, and compliance.



## Field Service

Chesterton's extensive local service network, will help manage your plant's critical assets by using value-driven solutions developed from our extensive portfolio of technologies, products, services, and knowledge. Our engineers, local field specialists, and technicians will supplement and help educate your workforce to meet short- and long-term needs.



## 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](http://www.chesterton.com)



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