



We make it ***possible***

MARINE

Propulsion Sealing Solutions
Stern Tube Seals



HUTCHINSON®

Stern Tube Seals

Technology & Operational Need

PRODUCT CONFIGURATIONS

Hutchinson offers two different Stern Tube Seal systems, both driven by the same advanced face seal material technology at their foundation. The seal configurations offer different features to provide the customer with the optimal performance based on specification and operational demand.

Military Grade - SQ300 Series

Configured for the most rugged of environments, Military Grade Stern Tube Seal systems offer redundant backups to ensure seamless operation even through casualty events and potential damage to the primary sealing systems.

Utilizing the most advanced face sealing materials, selected based on thousands of hours of testing and years of tribology surveys, the Military Grade Stern Tube Seal systems ensure service life that outlasts the competition and reduces dry dock maintenance intervals. Designed hand-in-hand with the US Navy, these systems are packed with safety and reliability features that are demanded by today's warfighter.

Commercial Grade - CG400 Series

Using the same advanced material face seal pairings, the Commercial Grade Hutchinson Stern Tube Seals offer the same long service life and reliability, without the added casualty prevention features intended for harsh environments. This reduces up-front cost while still providing the end user with long service life, and reduced maintenance cost, all while maintaining reliability. The vessel can operate with confidence longer, with less downtime, saving owners/operators both time, and money.

PATENTS: UNITED STATES

Stern Tube Seal System
9,970,545 B2



THE HUTCHINSON DIFFERENCE

Using 100 year old technology will only get you or your vessel so far. With the customer seeking improvements, Hutchinson's innovative spirit has driven face sealing into the 21st century. These Stern Tube Seal Systems have undergone development and testing at the laboratory material science levels all the way through full scale shock and sea trial testing.

Calling on expertise in the areas of fluid sealing, tribology, material science, manufacturing and testing, and applying them at the waterfront level has ensured that the customer receives not only the best seal available, but the best overall sealing SYSTEM. Hutchinson is recognized as a leader in the sealing industry, and mechanical face seals are no different.

FACE SEALING

Mechanical Face Seals have been in existence for over 100 years, and to this date, the fundamentals of how face seals work have remained unchanged. The two faces interact with each other, one stationary face, and one rotating face, a phenomenon known as hydrodynamic lift occurs.

This lift produces a microscopic film of fluid between the two surfaces creating a liquid tight barrier while also allowing for the seal to operate under very low friction. Because the face materials are not interacting with one another, instead, riding on the fluid film, mechanical face seals can operate for long intervals without the need for repair or replacement.

Key Stern Tube Seal Features

Features & Benefits

SYSTEM BENEFITS

Longer MTBO & MTBF

While Mechanical Face Sealing is a centuries old technology, Hutchinson's Stern Tube Seals are the combination of tried and true mechanical systems and advanced material science. Exhaustive tribology research was conducted in order to determine the optimal combination of rotating and stationary faces that can operate a near zero friction while still maintains the correct thin film fluid sealing boundary. This low friction operating profile ensures that the primary face seals can operate longer, at higher speeds, without expensive maintenance and replacement cost.

Improved Reliability

Ruggedized sealing materials are utilized to withstand harsh environmental challenges such as corrosion, shock, and vibration. These materials mean that the Hutchinson Stern Tube Seals continue to operate when others may fail.

Increased Safety

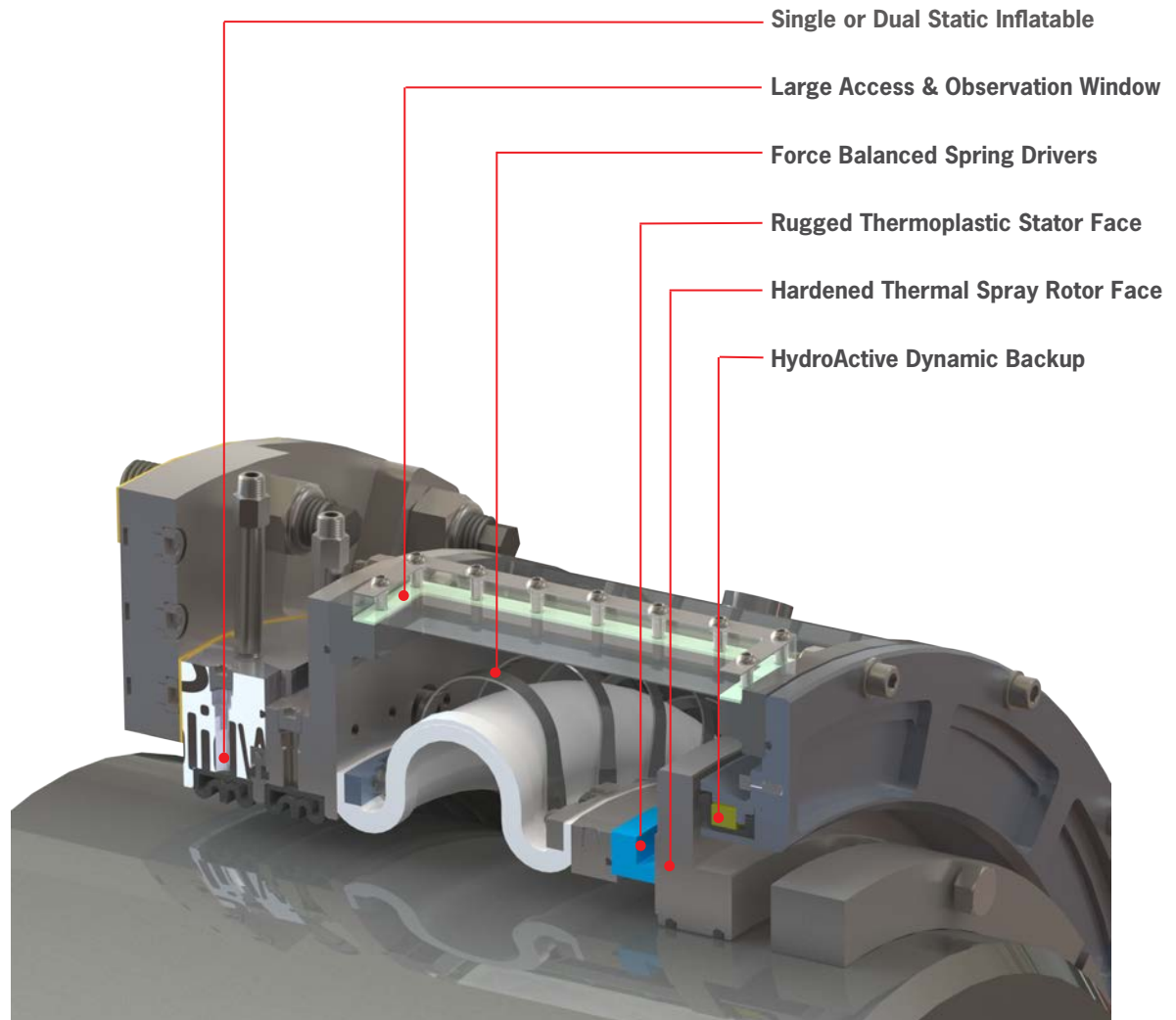
Redundant safety systems have been integrated into the Hutchinson Stern Tube Seal System to protect against worst case scenario and allow vessels to continue to operate through casualty events.

**Dynamic backups available for Military Grade Systems*

Easier to Maintain

All components are fully split, and housings feature large access ports to make maintenance a breeze when inspections and overhauls become necessary. Components can be removed and installed without the need to dry dock, or to remove shafts from operation.

SYSTEM KEY FEATURES



Military Grade Stern Tube Seals

SQ300 Series - Shock & Vibration Qualified

Target markets & Vessel Types

Designed with the military operated vessel and in mind to keep the warfighter moving forward. These seals incorporate advanced safety and reliability features unique to the most demanding environments.

Dual Inflatable Static Sealing

Two-Valve protection eliminates the need for coffer dams and divers in the water during water borne maintenance. Redundant backup during casualty event. Can be inflated using LP-Air, Emergency CO2 Cask Air, or even manually using a pump.

Automatically Engaging Dynamic Backup

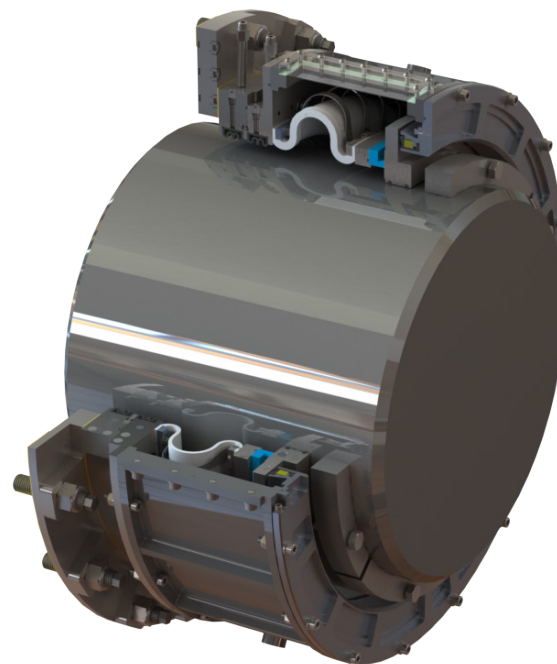
Dynamic Backup Seal engages automatically in the presence of water if there is a primary seal failure. Water is trapped in the housing and activates the propriety HydroActive foam in order to engage the backup dynamic elastomer seal while still allowing the shaft to operate with zero downtime or degradation in performance.

Auto-Pressure Balancing Face Seal

Face Seal and Spring Pressure automatically balanced based on patented face seal geometry ensures optimal performance throughout entire service life.

Raw-Water Cooled

Does not require special lubricants, oils, or EALs. Sealing faces are cooled using strained raw water which is flushed back through the stern tube.



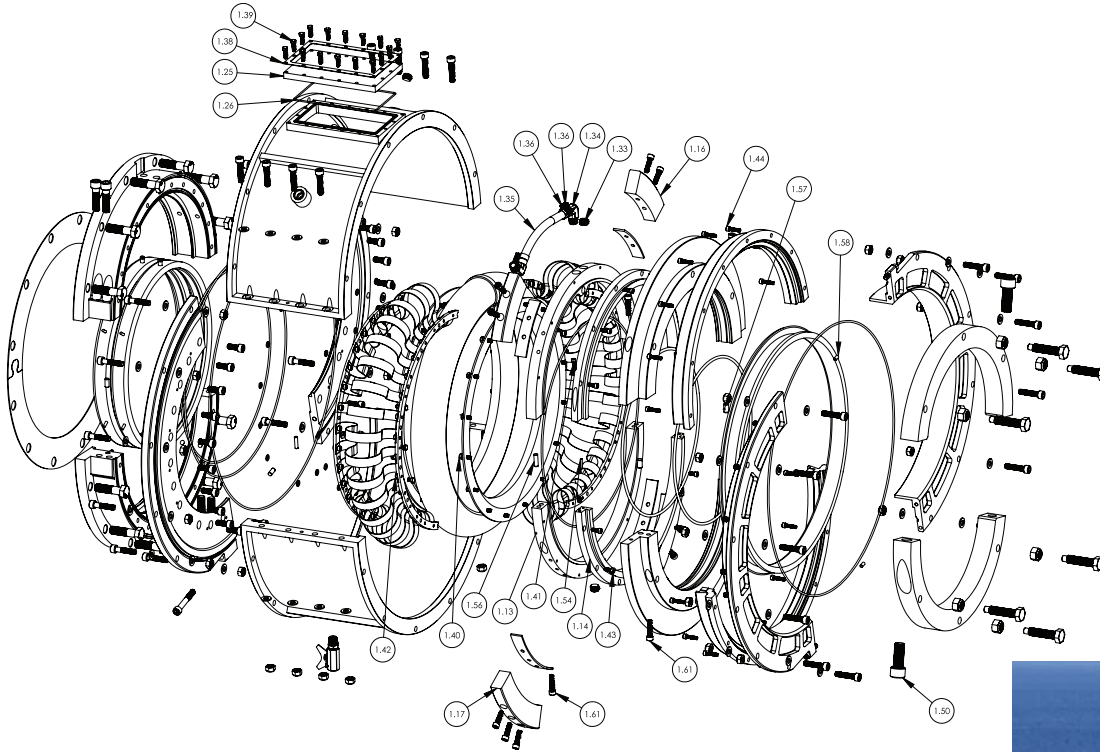
SYSTEM SPECIFICATIONS

Operating Pressures	Up to 30 psi (2 bar)
Shaft Surface Speed	0-2000+ RPM
Leak Rate *	STATIC = Less than 1 US Pint per minute (473 ml/min) < 300 HRS Less than 0.03 pints per minute (16mL/Min) > 300 HRS DYNAMIC = Less than 3 Gallons per Minute (11.36L/min) < 300 HRS Less than 0.53 Pint Per Minute (0253 ml/min) >300 HRS
Radial Shaft Deflections	Up to 25mm, 1.00" (zero to peak)
Key Features	Fully Split, Dual Inflatable, Dynamic Backup, Raw-water Cooled
Approvals	NSWC/NAVSEA, MIL-S-901D/E, MIL-S-167A

**Leakage rate subject to customer specification requirement. Seals greater than 20 inches in diameter may require higher or lower allowable leakage.*

Military Grade - When Performance Matters

Shaft Diameters from 100mm - 1,000mm+



Our **Military Grade** designs are fully engineered to the exact vessel specification to ensure a perfect fit for each application.

Contact us for a design!



Commercial Grade Stern Tube Seals

CG400 Series

Target Markets & Vessel Types

Intended for Commercial applications and small craft which do not have the same Shock survivability requirements, the Commercial Grade Stern Tube Seal still utilizes the same advanced face sealing materials without all of the expensive redundant safety failsafe.

Raw-Water Cooled

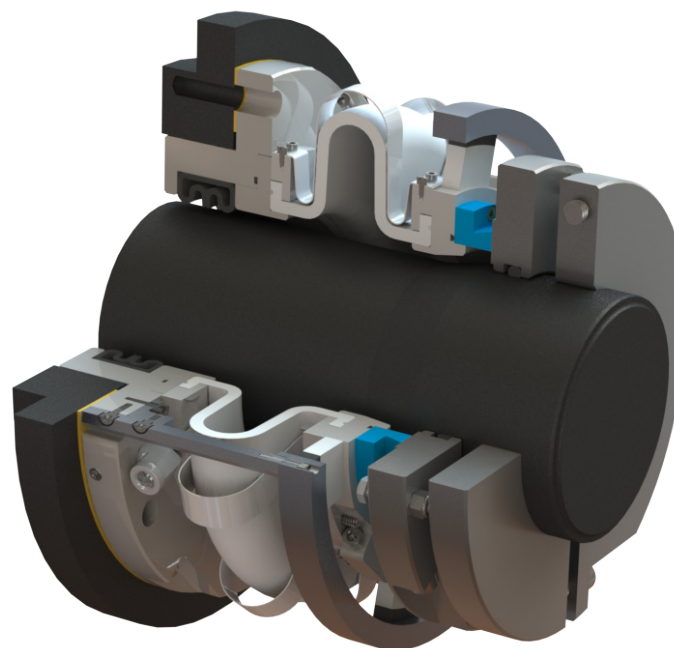
Does not require special lubricants, oils, or EALs. Sealing faces are cooled using strained raw water which is flushed back through the stern tube.

Fully Customizable

With so many different vessels requiring differing shaft diameters, the Hutchinson Commercial Grade Seal offers a wide variety of size and diameter options to meet your needs cost effectively. Fully custom applications are also available for applications which have special requirements.

Advanced Face Seal Materials

Using the same Face Seal material pairings as the Military Grade Stern Tube Seal Systems mean that this system incorporates the highest quality, most durable mechanical face seals on the market to keep your vessel running longer, more reliability, with less maintenance cost and downtime. Works harder so you can too.



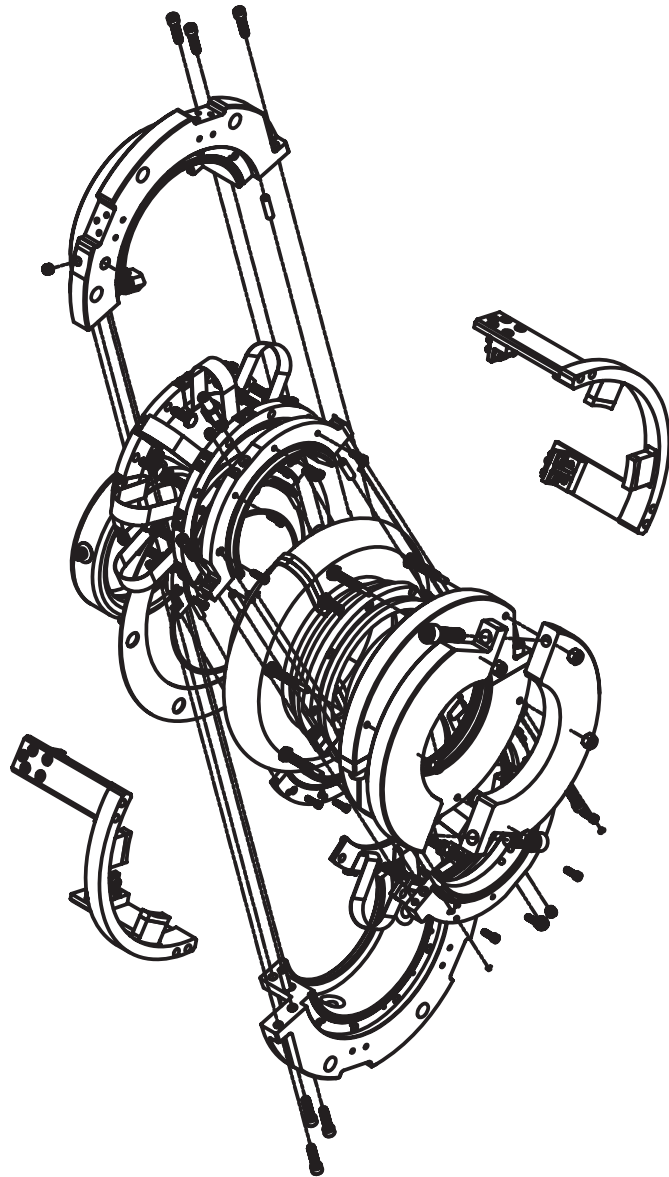
SYSTEM SPECIFICATIONS

Operating Pressures	-7.5 (Vacuum) Up to +30 psi (2 bar)
Shaft Surface Speed	0-2000+ RPM
Sizing	50-1000mm - Standard Cross Sections in 10mm Increments, Custom Sizing also Available
Leak Rate*	STATIC = Less than 1 US Pint per minute (473 ml/min) < 300 HRS Less than 0.03 pints per minute (16mL/Min) > 300 HRS DYNAMIC = Less than 3 Gallons per Minute (11.36L/min) < 300 HRS Less than 0.33 Pint Per Minute (158 ml/min) >300 HRS
Shaft Deflections	Up to 100mm, [3.9"] (zero to peak)
Key Features	Non-Contacting, Non-Rotating, Reusable

*Leakage rate subject to customer specification requirement. Seals greater than 20.0-Inches in diameter may require higher or lower allowable leakage.

Commercial Grade Stern Tube Seals - Work Harder & Last Longer

Shaft Diameters from 50mm - 1,000mm



Our **Commercial Grade** design can be engineered to meet your sealing needs. Standard Cross sections in 10mm design increments or custom configurations are available.

Contact Hutchinson today to size the right system for your vessel's needs.



Origins

A Long Propulsion Sealing History

Our Stern Tube Seal technology was originally driven by a need of the United States Navy to improve upon legacy systems and deliver the peak performance and longevity that the war fighter demands. After the United States Navy Destroyer USS Cole (DDG 67), was attacked in Yemen in 2000, and a compartment was flooded when a bulkhead seal failed, the United States Navy sought a better bulkhead seal, which Hutchinson delivered, eventually transitioning to multiple surface warfare vessel platforms as well as commercial and civil applications worldwide. Hutchinson delivered, eventually transitioning to multiple surface warfare vessel platforms as well as commercial and civil applications worldwide.

Hutchinson continues on this tradition designing, developing, and fabricating Stern Tube Seals to ensure that the customer receives the highest quality, most advanced, products, which have been Hutchinson's mission across several other markets such as Ground Defense, Aerospace, and Automotive. Hutchinson is no stranger to challenging performance demands and strives to not only meet, but exceed customer expectations.

At Hutchinson, **We Make It Possible.**



QUALIFIED SERVICE PROVIDER

Hutchinson provides unparalleled customer service and support throughout the life of its marine products.

- A professional team with an extensive repertoire of skills and expertise
- Delivering support, installation, inspection, and maintenance
- Managing complex efforts at U.S. shipyards and abroad
- Turnkey Installation
- Field Testing
- Rigging
- Alignment
- Vibration Analysis
- Routine Maintenance
- Hydro Static Testing and Inspection

CONTACT INFORMATION

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