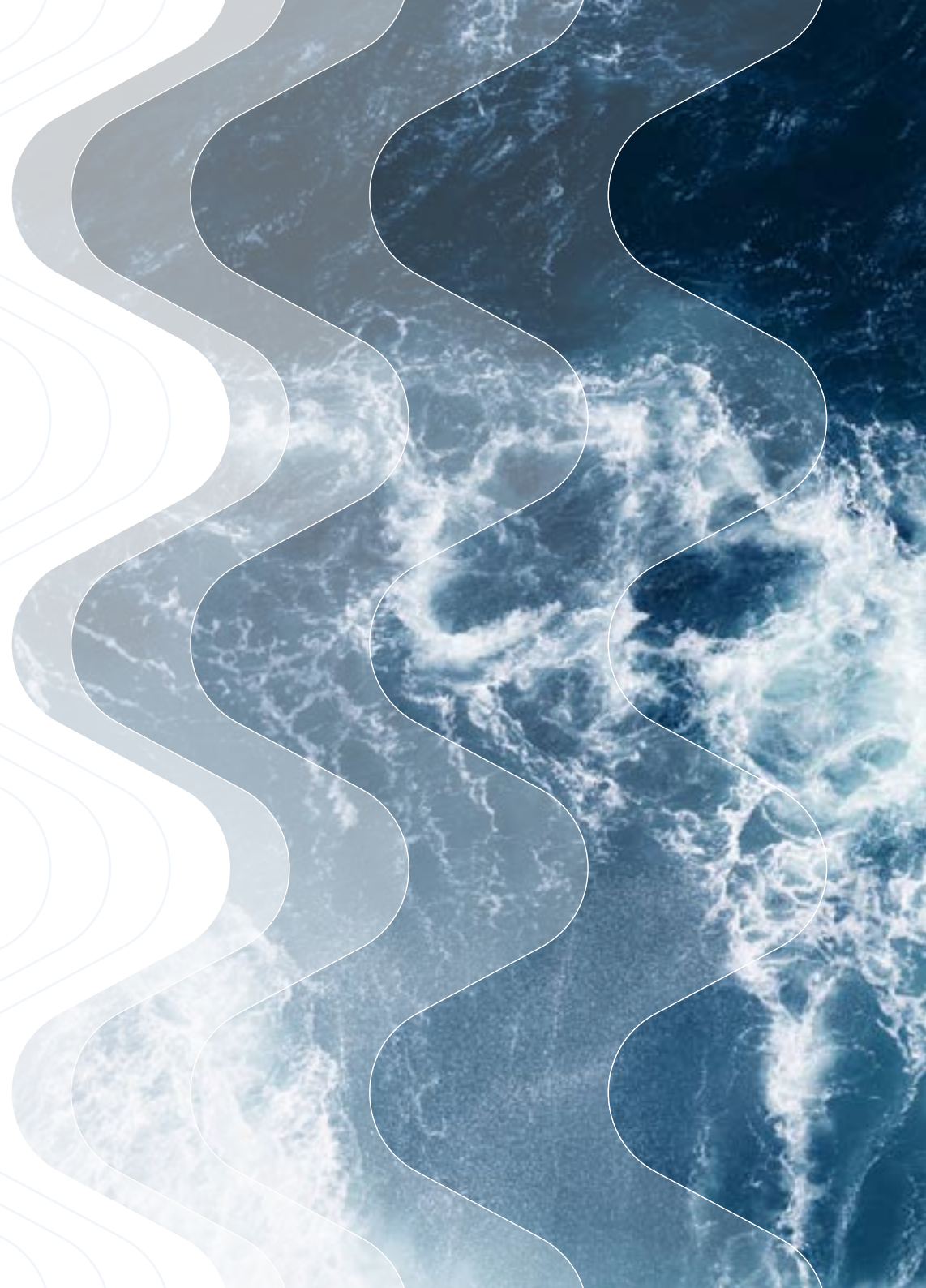


LEADING  
**CYLINDER  
LUBRICATION  
TECHNOLOGY**





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# LEADING CYLINDER LUBRICATION TECHNOLOGY BY DEDICATED SPECIALISTS



# WE REDUCE CYLINDER OIL CONSUMPTION AND IMPROVE ENGINE CONDITION DURING THE GREEN TRANSITION

## LOWER OIL CONSUMPTION AND REDUCE EMISSIONS

HJ Lubricators is the leading global provider of cylinder lubrication systems for two-stroke marine engines.

Our solutions significantly reduce the cylinder lube oil consumption and extend the lifetime of liners and piston rings. HJ technology supports the use of bio fuels and dual fuels.

We recognise the need for climate friendly measures and our solutions reduce CO<sub>2</sub> and particle emissions in particular.

## PATENTED TECHNOLOGY

Our patented technology guarantees precise lubrication with every engine revolution. This is achieved through high-pressure injection valves that use the innovative Swirl Injection Principle (SIP), delivering atomised spray of lube oil into the combustion chamber ensuring even distribution along the cylinder liner. Our design allows in addition multiple injections per revolution.

## LEADING EXPERTS

With approximately 100 years of experience, innovation is in our DNA and therefore we push cylinder lubrication technology forward in close collaboration with universities doing scientific research on mathematic spray modelling, cavitation in cooperation with oil makers and engine designers.

**Welcome aboard!**



# PEOPLE KNOWLEDGE & COLLABORATION

Our team of engineers and technicians specialise in cylinder lubrication and condition of 2-stroke marine engines.

Whether you are a ship owner or Technical Manager you can trust in our expertise, this we've cultivated over more than 100 years - enabling you to focus your time and energy on other high-priority tasks.

At HJ Lubricators we constantly push the boundaries of lubrication technology. Sharing our knowledge by actively educating both employees and customers - clearly, thoroughly and with purpose - is a cornerstone of our continued success.

Through strategic collaborations with leading international universities, we transform cutting-edge research into innovative products and services. This enables vessel owners to reduce operational costs and emissions - advancing a more sustainable and efficient future for the maritime industry. Working with HJ Lubricators is your guarantee for premium solutions and value.

Partnering with HJ Lubricators means choosing premium solutions and lasting value - delivered with expertise, innovation, and a commitment to excellence.



# PRODUCTS AND SERVICES

## LUBRICATORS

Representing a century of in-house R&D, and manufacturing - with a sole focus on optimising cylinder liner and piston ring lubrication.

Properly designed systems ensure precise distribution, reduced wear, lower operating costs, and minimised environmental impact.

Built on patented technology, featuring multi-timing and an Automatic Cleaning Sequence - fully compliant with future fuel types.

## INJECTION VALVES

The unique feature of our valves is the atomising of cylinder oil in the combustion chamber using the 'Swirl Injection Principle'. Enjoy the benefits of better distribution on the cylinder liner, a more stable oil film and lower cylinder lubrication oil consumption of up to 60%.

For older engine types, we supply cost-efficient enhanced non-return valves designed to improve reliability and functionality.

## SERVICES

HJL offers a range of services including 24/7 technical support, cylinder liner wear measurement, Cylinder Condition Optimisation Programme, reconditioning of existing lubricators, SIP Service maintenance programme and crew training.

## SMARTLINK™

Smartlink enables remote monitoring of key lubrication data - optimising engine performance in real time and unlocking the full potential of your lubrication system.







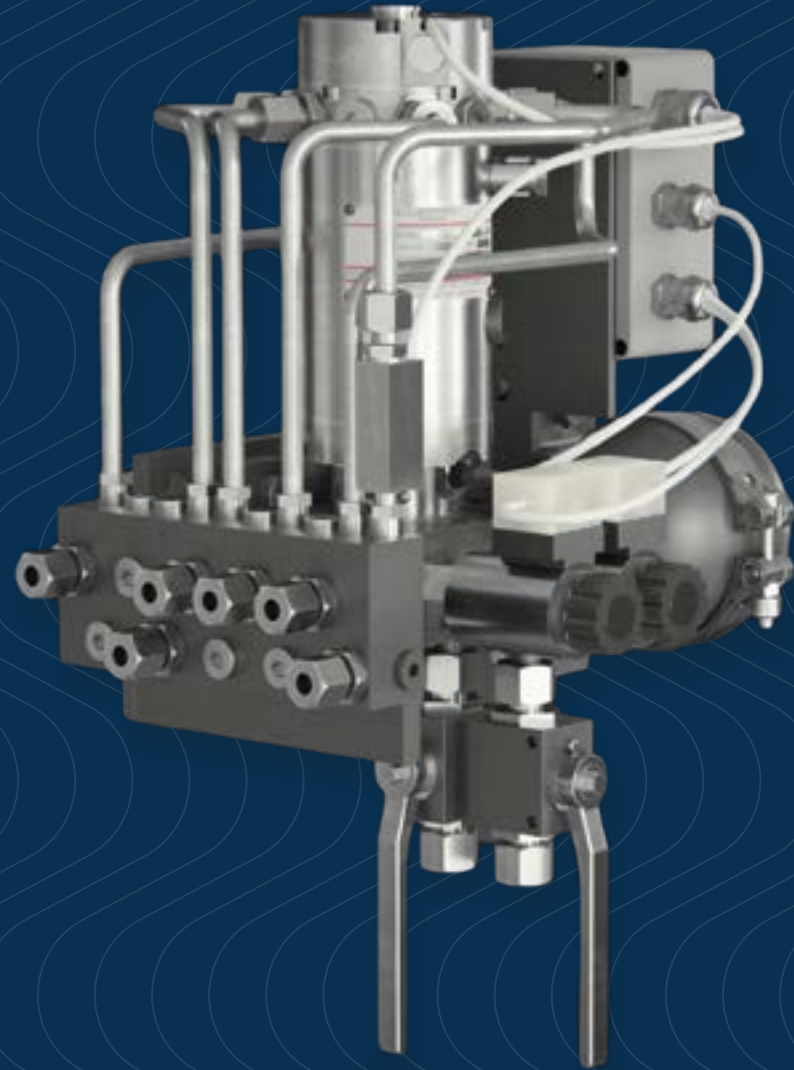


# CYLINDER OIL INJECTION

The complexity of today's engine designs, the push for lower emissions, and the demand for reduced operating costs all make it essential to use advanced lubrication systems that can inject an exact amount of cylinder oil at precisely the right time and location.

Over-lubrication leads to carbon build-up, increased deposits, and inefficient combustion, while under-lubrication causes accelerated wear of piston rings and cylinder liners.

Only a system capable of delivering the correct volume of oil with precision at every engine revolution can ensure optimal protection and longevity of critical engine components.





## ATOMISING CYLINDER OIL INTO THE COMBUSTION CHAMBER

HJ SIP (Swirl Injection Principle) is the principle of atomising cylinder oil and injecting into the scavenge air swirl at a high pressure leading to optimal distribution of the cylinder oil on the entire upper liner surface (combustion area) which is the most exposed area in the engine.

The technology is patent protected by HJL.





# HJ LUBRICATORS

THE HJ PRODUCT LINE  
INCLUDES BOTH CYLINDER  
LUBRICATORS AND SIP  
VALVES INJECTION



## HJ SMARTLUBE 4.0

Advanced common rail technology without individual lubricators, where every valve injects oil independently based on patented algorithm allowing multiple injections per piston stroke.

### Patented lubrication technology

HJ Smartlube 4.0 integrates the lubricator into the HJ SIP (Swirl Injection Principle) injection valve, thereby eliminating the need for an individual lubricator on each cylinder, meaning the system consists of fewer parts making maintenance and trouble-shooting faster and more customer-friendly.

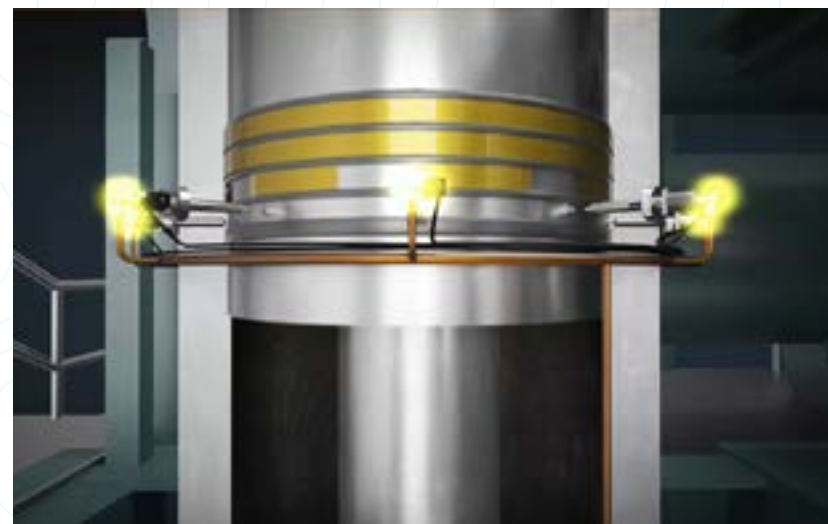
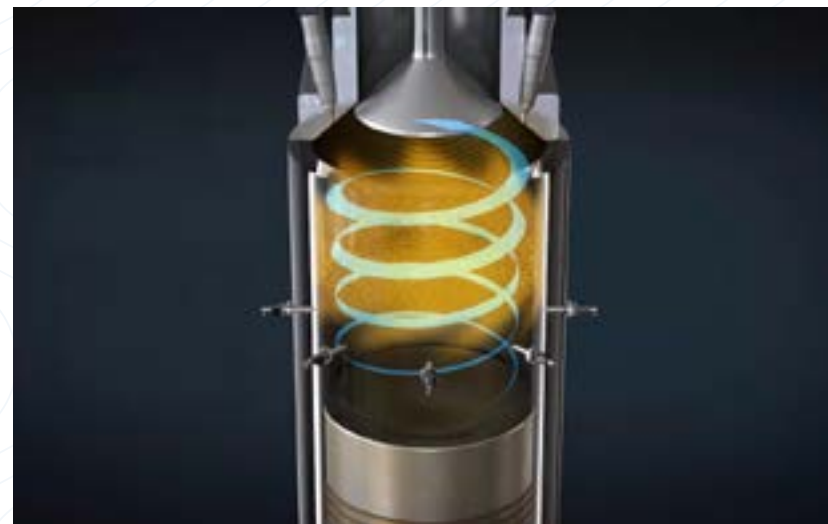
The design gives an unprecedented level of flexibility that can be fully customised to the unique requirements of each engine (design, operation pattern, fuel in use, etc.).

### System design

The HJ Smartlube 4.0 system is greatly simplified compared to other lubrication systems as there is no individual lubricator for each cylinder. Instead, each injection valve is actually a lubricator, able to adjust feed rate, timing etc.

### Flexible injections

Volume adjustment of every injection: Every valve can individually adjust the opening time very precisely, which allows each valve to apply different feed rates. Imagine a 60-bore cylinder with 6 injection valves where it is possible to adjust different volumes at every single valve.







## HJ LUBTRONIC 2.0

Electronic lubricator system that adjusts the feed rate according to engine load or sulphur content of the fuel oil. This effectively reduces cylinder oil consumption and optimises cylinder condition and engine reliability.

The system is simple to operate on our user-friendly HMI. Cylinder oil is injected in every engine revolution – even at low load operation (slow steaming). This is crucial at all operating loads to protect effectively against abrasive and corrosive wear. HJ Lubtronic 2.0 also features Delta-Timing and Automatic Cleaning Sequence.



## HJ MECHTRONIC

Electronic control system that can be retrofitted to existing mechanical lubricators, making the lubrication system electronically controlled with load and sulphur regulation.

Regulation of consumption is achieved by individual control of each lube point being equipped with separate flow-switches, making HJ Mechtronic a very flexible solution.



## HJ X-TRONIC

Electronic control system that can be retrofitted to existing mechanical lubricators, making the lubrication system electronically controlled with load and sulphur regulation.

Regulation of consumption is achieved by an actuator which adjusts the stroke length automatically.



# HJ INJECTION VALVE

### SIP VALVES

HJ SIP valves utilise engine scavenge air to distribute the cylinder-lubricating oil, thereby the 'Swirl Injection Principle'. For each piston stroke the engine takes, a small amount of cylinder-lubricating oil is sprayed from the valves.

The system prevents wear and corrosion of the liner by atomising the cylinder lube oil into the combustion chamber. The result is an optimal distribution of the oil on the upper liner surface which is the most vulnerable part of the cylinder.

HJ Smartlube 4.0 integrates lubricator and SIP valve in one compact unit. Our other HJ lubricators can be combined with both non-return valves and SIP valves.







### NON-RETURN VALVES

HJ non-return injection valves have a reduced injection hole diameter and thereby an increased opening pressure. This secures faster oil flow, which means that the oil does not simply run down the liner wall below the valve, but is actually injected into the piston ring pack for improved distribution and higher efficiency. The HJ non-return valves fit into existing quills. No machining or other mechanical modifications of cylinder liners is needed.





# HJ SERVICES

## CYLINDER LINER WEAR MEASUREMENT

HJL offers an accurate measurement of cylinder wear that shows the actual cylinder condition. The VAK measuring process is time efficient as it takes one person approx. 1½ hour of work per unit and removal of cylinder cover is unnecessary, so cylinder condition can be determined quickly with minimal disruption. In addition, using a Ninja DS-cam provides a clear and reliable picture of the entire combustion space with 3D images.

## CYLINDER CONDITION OPTIMISATION PROGRAMME

Running a two-stroke engine efficiently is becoming increasingly complex. That's why working with cylinder lubrication specialists is more important than ever. We conduct root cause analysis, taking all parameters into consideration such as lubrication system, engine design, piston ring design, SDA, scavenge port inspection, fuel and cylinder oil in use and much more. In other words, we offer a comprehensive 360-analysis to make the optimal recommendations to feed rate, maintenance, and cylinder lube oil.

## LUBRICATOR RECONDITIONING

We offer reconditioning of HJL cylinder lubricators. Our lubricators have a durability as long as that of the main engine. To ensure optimal performance, inspection or maintenance of valves and lubricators is required.

## SIP SERVICE MAINTENANCE PROGRAMME

You can join our maintenance exchange programme for SIP valves. Servicing is scheduled at regular intervals, e.g. 12,000 - or 15,000 hours of operation. You switch the used valves with a new set and let us check pressure and overall performance before returning them to the vessel reconditioned.

## CREW TRAINING

As technology evolves and the need for further specialisation arise, we offer our clients crew training. It can take place onboard your vessel, via webinar or a seminar in a physical location if that is most convenient. Our technicians are experts in lubrication and cylinder condition.

## 24/7 TECHNICAL SUPPORT

Our technical support ensures immediate access to expert assistance for any technical matters.



# HJ SMARTLINK™

HJ Smartlink™ takes cylinder lubrication online and presents the data you need for running an efficient engine with lower cost and reduced emissions.

Data access brings you full transparency of the lubricator performance on several parameters. Enjoy the benefits from remote monitoring of:

- ~ Feed rate
- ~ Average oil consumption
- ~ Fuel index
- ~ Engine load
- ~ Engine speed RPM
- ~ Alarms and notifications
- ~ Route and location on a map

## BOOST EFFICIENCY

HJ Smartlink™ opens up for predictive maintenance of the cylinder lubrication system and the engine. This helps your team, and you reduce costs on maintenance and avoid immobilisation.





# G&O MARITIME GROUP MARKET-LEADING BRANDS IN ONE PIONEERING GROUP

In 2022 HJ Lubricators was acquired by G&O Maritime Group. This drives for opportunities even further on a global scale and benefit shipping companies, striving to make vessels a greener and safer place to work. The companies have a long and proud history of inventing market leading products.



## **Propulsion management**

Offers vibration compensators, cylinder lubrication systems and piston rod stuffing boxes. We cooperate with engine manufacturers and shipping companies to optimise main engine operations, supporting the important task of utilising new environmentally friendly fuel types.



## **Tank management**

Provides PV valves and protects tank vessels against unintended overpressure or vacuum, whilst simultaneously protecting against fire risk and ensuring that emissions from the cargo is kept to a minimum, as in accordance with IMO standards.

## **ABOUT G&O MARITIME GROUP**

We are a group of sub system providers to the maritime industry, all developing high quality products and enabling our customers through a green transition in the maritime industry.

Our brands are divided into 4 divisions:



## **Water & Waste management**

Includes incineration plants and biological water purifying plants, securing that waste water is purified before discharge while solid waste and oil sludge is incinerated at high temperatures to reduce SOx and NOx emissions.



## **Service management**

Provides specialised solutions for the maintenance, repair and optimisation of critical marine equipment, ensuring the reliability and longevity of vessel operations. With expertise in boiler systems, automation and spare parts, services are designed to minimise downtime and enhance efficiency.





## G&O COMPENSATORS

Compensators that eliminate vibrations at the source, reducing cost, improving comfort, and cutting fuel spend.



Piston rod stuffing boxes for two stroke engines continuously improved to live up to new fuel types entering the market.

## HJ Lubricators

Leading global provider of cylinder lubrication systems for two stroke marine engines.



Valves and venting equipment reducing emissions from cargo while keeping vessels, equipment and crews safe every day.

## G&O BIOREACTORS

Biologically cleaning of grey and black waste water before it is discharged.



Incineration of waste and oil sludge, eliminating the need for discharging to shore while reducing emissions from incineration.

## Global Boiler Services

Specialised 24/7 solutions for the maintenance, repair, and optimisation of marine boilers and critical equipment.



G&O MARITIME GROUP®

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At G&O Maritime Group we enable our customers during the green transition in the maritime industry