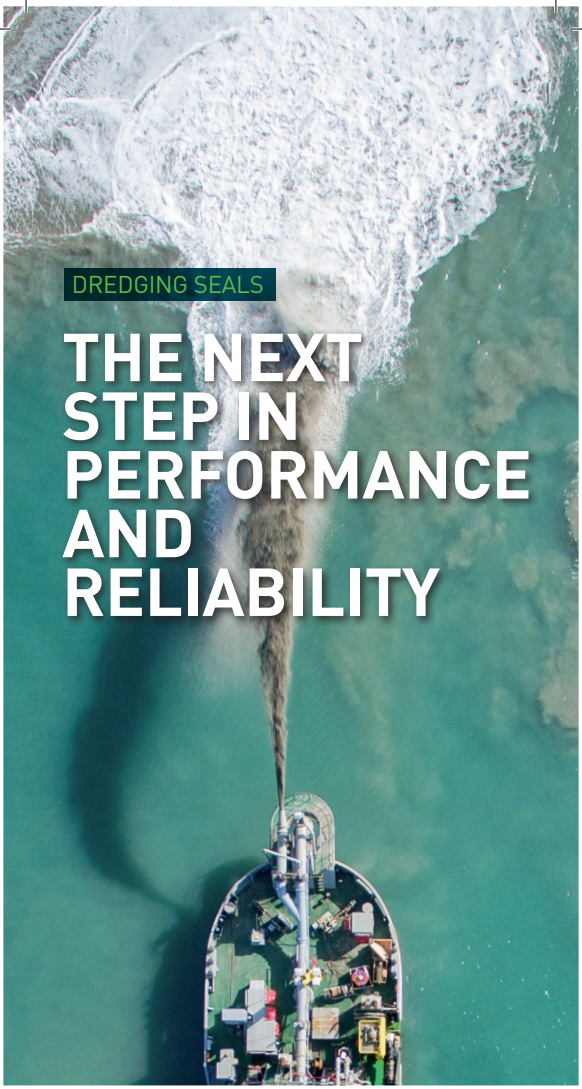
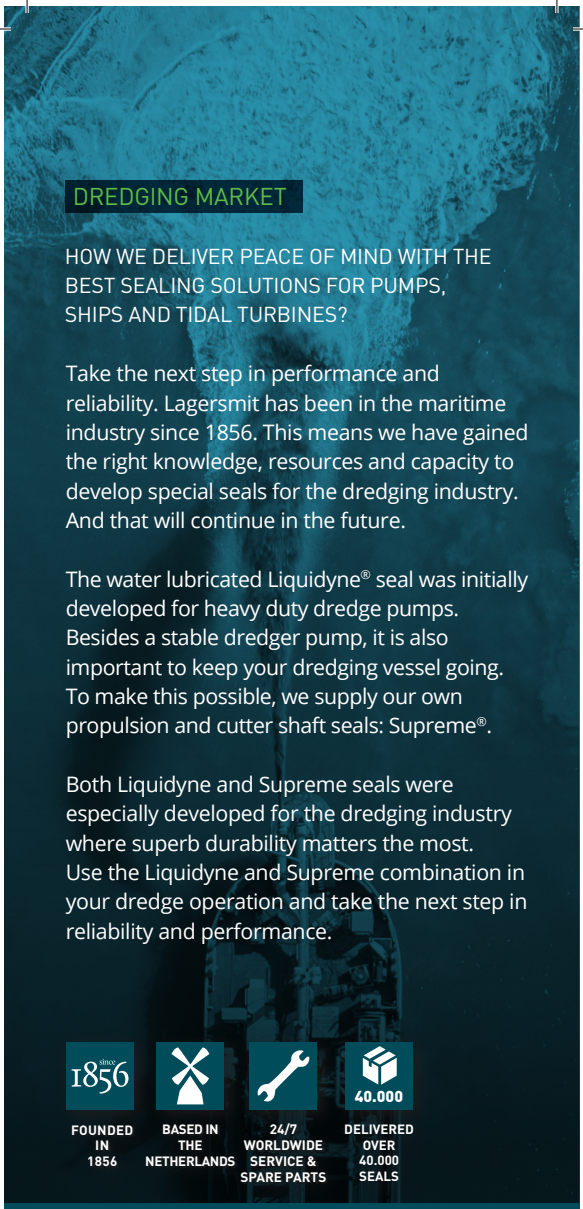


LAGERSMIT

THE ORIGIN OF SEALING SOLUTIONS



DREDGING MARKET

HOW WE DELIVER PEACE OF MIND WITH THE BEST SEALING SOLUTIONS FOR PUMPS, SHIPS AND TIDAL TURBINES?

Take the next step in performance and reliability. Lagersmit has been in the maritime industry since 1856. This means we have gained the right knowledge, resources and capacity to develop special seals for the dredging industry. And that will continue in the future.

The water lubricated Liquidyne® seal was initially developed for heavy duty dredge pumps. Besides a stable dredger pump, it is also important to keep your dredging vessel going. To make this possible, we supply our own propulsion and cutter shaft seals: Supreme®.

Both Liquidyne and Supreme seals were especially developed for the dredging industry where superb durability matters the most. Use the Liquidyne and Supreme combination in your dredge operation and take the next step in reliability and performance.

since 1856
FOUNDED IN 1856

BASED IN THE NETHERLANDS

24/7 WORLDWIDE SERVICE & SPARE PARTS

40.000
DELIVERED OVER 40.000 SEALS

REAL STORY

"The construction of the new Suez Canal in Egypt is one of our eye catchers.

At 170 km, the Suez Canal is the shortest shipping route between Europe and Asia. To increase the canal's capacity and industrial activity in the region, a second 50 km-long shipping lane was added to the canal.

Jan De Nul Group performed one-third of the total works. The Group mobilised seven cutter suction dredgers for this project. The dredging pumps with the Liquidyne® seals held their own throughout the entire project."

JOOP VAN TATENHOVE
Jan De Nul Group



IMAGE: COURTESY OF JAN DE NUL GROUP

REAL PRODUCTS

LIQUIDYNE®
PUMP SHAFT SEALS

WHEN IT COMES TO DREDGING EQUIPMENT, RELIABILITY IS THE KEY. YOU NEED TO KEEP THE DREDGING PROCESS GOING, 24 HOURS A DAY, 7 DAYS A WEEK.

Dredge pumps have to cope with severe shocks and vibrations, may force wrong alignment and an abrasive medium. The Liquidyne pump shaft seals are specially designed to withstand events such as these. Added to that, the condition of the seal can be monitored so that you know exactly how long you can continue dredging.

PRODUCTS

- Liquidyne® 2-Stage
- Liquidyne® 3-Stage WA
- Liquidyne® LDS

APPLICATIONS

- Dredge pumps
- Booster pumps
- Jet pumps
- Cooling water pumps
- Slurry pumps
- Deep well pumps

IMAGE: COURTESY OF ROYAL IHC

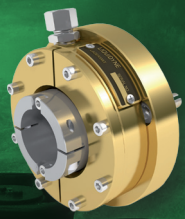
REAL PRODUCTS

LIQUIDYNE®
2-STAGE

PUMPING RELATIVELY CLEAN (COOLING) WATER? FOR UP TO 40 BAR PRESSURE AND ABRASIVE PARTICLES UP TO 100 MICRON, THE LIQUIDYNE 2-STAGE WATER PUMP SEAL IS THE IDEAL SOLUTION. THIS LIQUIDYNE SEAL IS REGULARLY USED IN WATER PUMPS, JET PUMPS, BOOSTER PUMPS AND OFFERS ALL THE LIQUIDYNE ADVANTAGES.

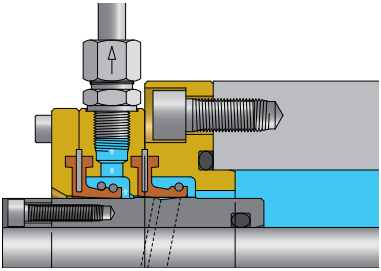
LIQUIDYNE 2-STAGE USPs

- Condition Monitoring
- Low power consumption
- Maximised maintenance interval
- Hard Metal Layer (HML) coating for extra durable grooved bushes
- No external flush needed



REAL FACTS

LIQUIDYNE® 2-STAGE



HOW IT WORKS

The Liquidyne 2-Stage design is used in pumps that process relatively clean water. In the 2-Stage design, the process water is used to lubricate the seal. Therefore the process water may contain abrasive particles no larger than 100 micron.

APPLICATIONS

- Dredge pumps
- Cooling water pumps
- Booster pumps
- Jet pumps



HORIZONTAL PUMP | VERTICAL PUMP | ABRASIVE PARTS ←100 Mμ | STUFFING BOX 1-40 BAR

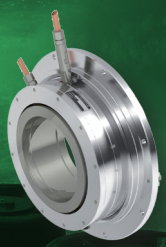
REAL PRODUCTS

LIQUIDYNE®
3-STAGE WA

THE LIQUIDYNE 3-STAGE WA PUMP SEAL IS USED IN PUMPS THAT PROCESS WATER CONTAINING A RELATIVELY LARGE NUMBER OF ABRASIVE PARTICLES OR PARTICLES LARGER THAN 100 MICRON. LAGERSMIT DEVELOPED THE LIQUIDYNE 3-STAGE WA ESPECIALLY FOR PUMPS IN WHICH THE PUMP WATER IS HEAVILY POLLUTED.

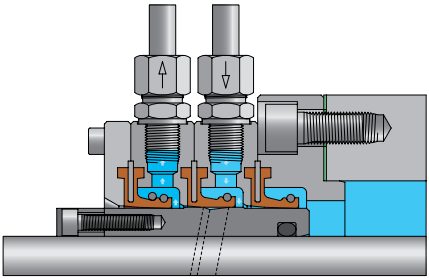
LIQUIDYNE 3-STAGE WA USPs

- Condition Monitoring
- Low power consumption
- Maximised maintenance interval
- Hard Metal Layer (HML) coating for extra durable grooved bushes
- Settling pipe to optimise flushing medium
- Optional bronze edition to increase lifetime



REAL FACTS

LIQUIDYNE® 3-STAGE WA



HOW IT WORKS

The Liquidyne 3-Stage WA seals the pump and uses an external flush to lubricate, cool and clean the seal. This water flow also enables the Condition Monitoring function.

APPLICATIONS

- Dredge pumps
- Cooling water pumps
- Booster pumps
- Slurry pumps
- Jet pumps
- Sewage pumps
- Mining pumps



HORIZONTAL PUMP | VERTICAL PUMP | ABRASIVE PARTS →100 Mμ | STUFFING BOX 1-40 BAR

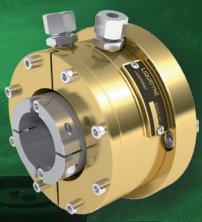
REAL PRODUCTS

LIQUIDYNE®
LDS

HAVING A WATER PUMP IN WHICH THE WATER CHAMBER IS DRY DURING START-UP? IS THE PRESSURE IN THE PUMP LOWER THAN THE ATMOSPHERIC PRESSURE?
THE LIQUIDYNE LDS HAS BEEN SPECIALLY DESIGNED TO COPE WITH THESE CONDITIONS AMONG OTHERS. IT ALSO ALLOWS FOR (MANY) ABRASIVE PARTICLES LARGER THAN 100 MICRON FLOWING THROUGH THE WATER.

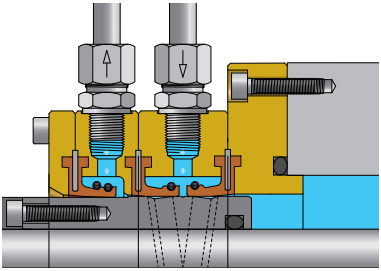
LIQUIDYNE LDS USPs

- Condition Monitoring
- Low power consumption
- Maximised maintenance interval
- Hard Metal Layer (HML) coating for extra durable grooved bushes
- Suitable for dry start-up



REAL FACTS

LIQUIDYNE® LDS



HOW IT WORKS

The Liquidyne LDS is suitable for pumps where the stuffing box runs dry during start-up. The Liquidyne LDS seals the pump and uses an external flush to lubricate, cool and clean the seal. The water flows through the seal, but also towards the pump side. This water flow enables the Condition Monitoring function.

- Cooling water pumps
- Booster pumps
- Slurry pumps
- Jet pumps
- Process pumps
- Deep well pumps



HORIZONTAL PUMP | VERTICAL PUMP | ABRASIVE PARTS →100 Mμ | STUFFING BOX -1-40 BAR

REAL PRODUCTS

FLOW METER

WHETHER IT'S A DREDGING OPERATION OR A COOLING WATER PROCESS, THE WORK GOES ON, DAY AND NIGHT, WORLDWIDE. LAGERSMIT INTRODUCES THE NEXT STEP IN ENSURING A STABLE PUMP OPERATION. WITH THE SPECIALLY SELECTED DIGITAL FLOW METERS, THE MONITORING OF THE LIQUIDYNE® SEAL AND THE PUMP CONDITION BECOMES VERY EASY.

FLOW METER BENEFITS

- Maintenance can be planned and intervals maximised
- Better control and accuracy of flush measurement
- The flow meter can be applied to all Liquidyne seals



REAL FACTS

FLOW METER

HOW IT WORKS

By installing the non-mechanical flow meter in a pipeline from the pump, the flow is logged without disrupting the flow. The data can be logged in your data management system or locally at the pump site.

The state of the bush is measured based on the flow. Due to the wear of the grooves on the bush, the flow decreases over time. The grooves are flattened and the lip seal will have more contact with the running surface. This allows less water to be transported over the bush. The water flow towards the drain decreases and, as a result, the drain flow decreases. If this drain flow is down to 20 % of the initial flow, maintenance is required.



CONDITION MONITORING



CONTROL ON FLUSH MEASUREMENT

REAL PRODUCTS

SETTLING PIPE

AS A DREDGING COMPANY, YOU ARE PAID FOR EVERY CUBIC METRE OF DREDGING SPOIL. YOU WORK WITH STRICT DEADLINES. EVERY DAY THAT YOUR DREDGE PUMP IS IDLE COSTS YOU MONEY. BESIDES CHOOSING THE LIQUIDYNE®, YOU CAN PROTECT THE SEAL EVEN MORE AGAINST WEAR WITH A SETTLING PIPE.

SETTLING PIPE BENEFITS

- A self-regulating and self-cleaning filter
- Protects the seal against excessive wear
- Already installed piping for gland flush can be used



REAL FACTS

SETTLING PIPE

HOW IT WORKS

A settling pipe is a self-regulating and self-cleaning filter developed to use outboard water as flush water for the Liquidyne® seal. By using the already installed gland flush, it is possible to use the existing piping. This is a great advantage compared to a filter which needs to be cleaned and replaced regularly. The settling pipe is used as standard in the dredging applications, but can also be applied in other circumstances.



ABRASIVE PARTS →100 Mμ

STUFFING BOX 1-40 BAR

REAL STORY

"What makes the Dutch Dredging dredgers unique is that they are deployed at locations that are generally inaccessible to large dredgers. This is why we opted for Liquidyne®. Dredging in shallow areas puts a lot of stress on seals and Liquidyne manages to hold up under such conditions!"

KEES KOOLE
Dutch Dredging



IMAGE: COURTESY OF DUTCH DREDGING

REAL PRODUCTS

SUPREME®
PROPULSION SEALS

WE BELIEVE A SEAL SHOULD DELIVER TOP PERFORMANCE, KEEP YOU GOING AND OFFER YOU PEACE OF MIND. THIS IDEA LED TO THE DEVELOPMENT OF THE SUPREME SEAL. INTRODUCED IN THE 1980'S AND FURTHER DEVELOPED EVER SINCE, SUPREME SEALS OFFER A 'PLUS' TO MANY PROPULSION SYSTEMS AND VESSELS OF DREDGING COMPANIES WORLDWIDE.

Besides a stable dredger pump, it is also important to keep your dredging vessel going. To make this possible, we supply our own Supreme shaft seals. Supreme seals are just like the Liquidyne® seals developed for dredgers where superb durability matters the most.

PRODUCTS

- Supreme® Standard
- Supreme SeaGuard®
- Supreme Ventus®
- Supreme® Bulkhead Seal (water & gas tight)

APPLICATIONS

- Stern tubes
- Thrusters
- Bulkheads
- Pods

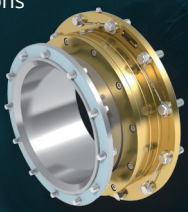
REAL PRODUCTS

SUPREME®
STANDARD

LOOKING FOR A RELIABLE STERN TUBE SEALING SOLUTION? THE SUPREME STANDARD IS THE BASIC DESIGN OF THE SUPREME RANGE. THIS SEAL IS MOSTLY APPLIED IN SEAGOING VESSELS ON CONVENTIONAL PROPULSION SYSTEMS, BOTH CPP AND FPP. COMING WITH A BROAD RANGE OF OPTIONS, THE SUPREME SEAL CAN BE FULLY TAILORED TO YOUR SPECIFIC SEALING NEED TO DELIVER YOU PEACE OF MIND.

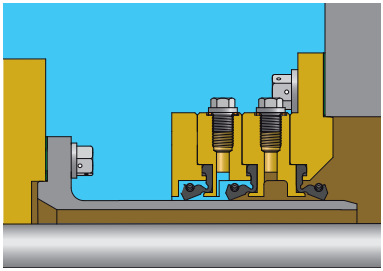
SUPREME STANDARD USPs

- Highly corrosion resistant
- Modular, made-to-measure
- Effectively separating water and lubricants
- Low Cost of Ownership
- Applicable with a broad range of options
- Suitable for either new build or retrofit applications



REAL FACTS

SUPREME® STANDARD



HOW IT WORKS

The Supreme Standard forward and aft seal form the basic designs of the Supreme range. Consisting of bronze housing parts (or cast iron to fit inland vessels) which are also available in a split version, the aft seal uses one oil and two water-repellent NBR lip seals to prevent water ingress and oil leakage. The forward seal contains two oil-repellent lip seal and cast iron housing parts. Both seals are executed with a chrome steel liner.

APPLICATIONS

- Various types of seagoing vessels
- Inland vessels

BRONZE AND CAST IRON HOUSING PARTS

UNIQUE GEOMETRY AND COMPOUND

DISTANCE RING

HARD METAL LINER COATING

DIRT BARRIER

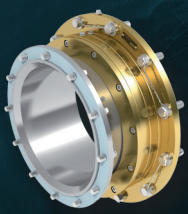
REAL PRODUCTS

SUPREME SEAGUARD®

DO YOU PREFER TO BE ON THE SAFE SIDE? THE SUPREME SEAGUARD GIVES YOU EXTRA SECURITY AGAINST OIL LEAKAGE INTO THE MARINE ENVIRONMENT. THE SUPREME SEAGUARD AFT SEAL IS EXECUTED WITH A REDUNDANT SECOND OIL-REPELLANT LIP SEAL THAT OFFERS THE MEANS TO STOP OIL LEAKAGE IN CASE OF LIP SEAL WEAR. THIS WAY THE SEAL ENSURES OPTIMUM SERVICE LIFE, EXTENDING THE DOCKING INTERVAL.

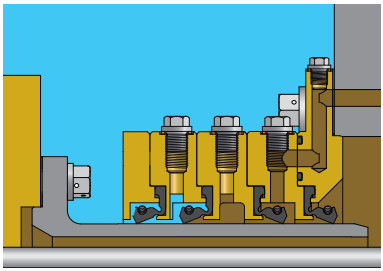
SUPREME SEAGUARD USPs

- Robust design
- Extra safety with a redundant lip seal
- Increased mean time between maintenance
- Low Cost of Ownership
- Modular, made-to-measure



REAL FACTS

SUPREME SEAGUARD®



HOW IT WORKS

The Supreme SeaGuard builds on the Supreme Standard seal and adds an extra lip seal module. This module serves as a back-up seal in case of leakage. That way, docking and maintenance can be postponed by putting this fourth seal to work.

The standard Supreme SeaGuard execution consists of bronze housing parts, a chrome steel liner, two oil-repellent and two water-repellent NBR lip seals.

APPLICATIONS

Various types of seagoing vessels

EXTRA LIP SEAL MODULE

BRONZE HOUSING PARTS

UNIQUE GEOMETRY AND COMPOUND

CHROME STEEL LINER

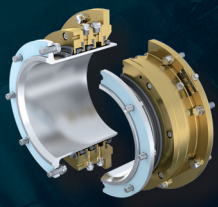
REAL PRODUCTS

SUPREME VENTUS®

LOOKING FOR A DURABLE, SELF-LEARNING SEALING SOLUTION THAT GUARANTEES ZERO-EMISSIONS OF OIL? THAT IS COMPLIANT WITH THE VESSEL GENERAL PERMIT (VGP)? THE SUPREME VENTUS GUARANTEES THIS, AN ABSOLUTE MINIMUM OF WEAR AND ENABLES YOU TO EASILY CHECK THE CONDITION OF THE SEAL. IT IS APPLICABLE ON ALL COMMON PROPULSIONS.

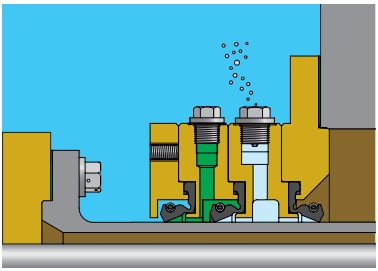
SUPREME VENTUS USPs

- 100% intelligent
  - 24/7 Condition Monitoring of the seal
  - Durable, self-regulating system
- Zero-emissions of oil
- Low Cost of Ownership
- Approved by DNV-GL, in compliance with EPA's VGP requirements



REAL FACTS

SUPREME VENTUS®



HOW IT WORKS

The Supreme Ventus enhances the Standard design with a with an advanced and self-regulating Condition Monitoring system. A core element of this zero-emissions seal is the valve which automatically matches the pressure in the seal to the prevailing water pressure to minimize wear. All fluids that enter the seal are drained into the transparent drain tank which can easily be accessed.

APPLICATIONS

- Ferries
- Inland water vessels
- Cruise ships
- Yachts
- Dredgers
- Bulk Carriers
- Container Carriers
- Tankers



ADVANCED AIR SYSTEM | INTERNAL DRAIN TANK | BRONZE HOUSING PARTS | NBR LIP SEAL | IN COMPLIANCE WITH VGP | CONDITION MONITORING

REAL PRODUCTS

SUPREME®
BULKHEAD SEAL (WATER & GAS TIGHT)

SAFETY ON BOARD SHOULD ALWAYS BE A PRIORITY. THE BULKHEAD SEAL IS GENERALLY USED TO PREVENT FLOODING OF THE SEALS ADJACENT COMPARTMENTS IN THE UNLIKELY EVENT OF AN ACCIDENT.

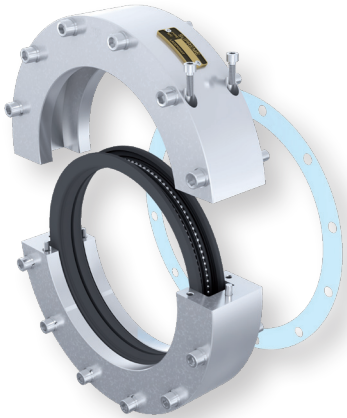
SUPREME BULKHEAD USPs

- Ensures a safe return to dock
- Allows large radial (5 mm) and axial (30 mm) play
- Can be used for low and high speed shafts



REAL FACTS

SUPREME® BULKHEAD SEAL (WATER & GAS TIGHT)



HOW IT WORKS

The Bulkhead seal consists of aluminum divided housing parts, comprising Supreme lip seals that are fitted on the shaft by ball chains. The lip seals can be bonded in situ, making it easy to install and do maintenance.



UP TO 2.0 BAR WATER PRESSURE

FULLY SPLIT DESIGN

SHAFT SIZES 110-710 MM

OPTIONAL GAS-TIGHT BULKHEAD

REAL STORY

Dirk Voogd, Manager Operations: "Cutter Suction Dredgers (CSDs) deliver top performance under highly varying and severe conditions. You are dealing with changing temperatures, and play and deformation of the bulkhead connector as well as the shaft. The dredging operation occurs just below the waterline, as well as at a depth of tens of metres. The seal must be 100% reliable under all of these conditions. From analysis to engineering, production and installation: Lagersmit supplies top products. In recent years, we supplied multiple seals for new-builds and retrofits to protect pump gear and cutter gear. It is absolutely terrific that we can help CSDs to get the most out of their operations with this type of special seals."

DIRK VOOGD
Manager Operations
Lagersmit

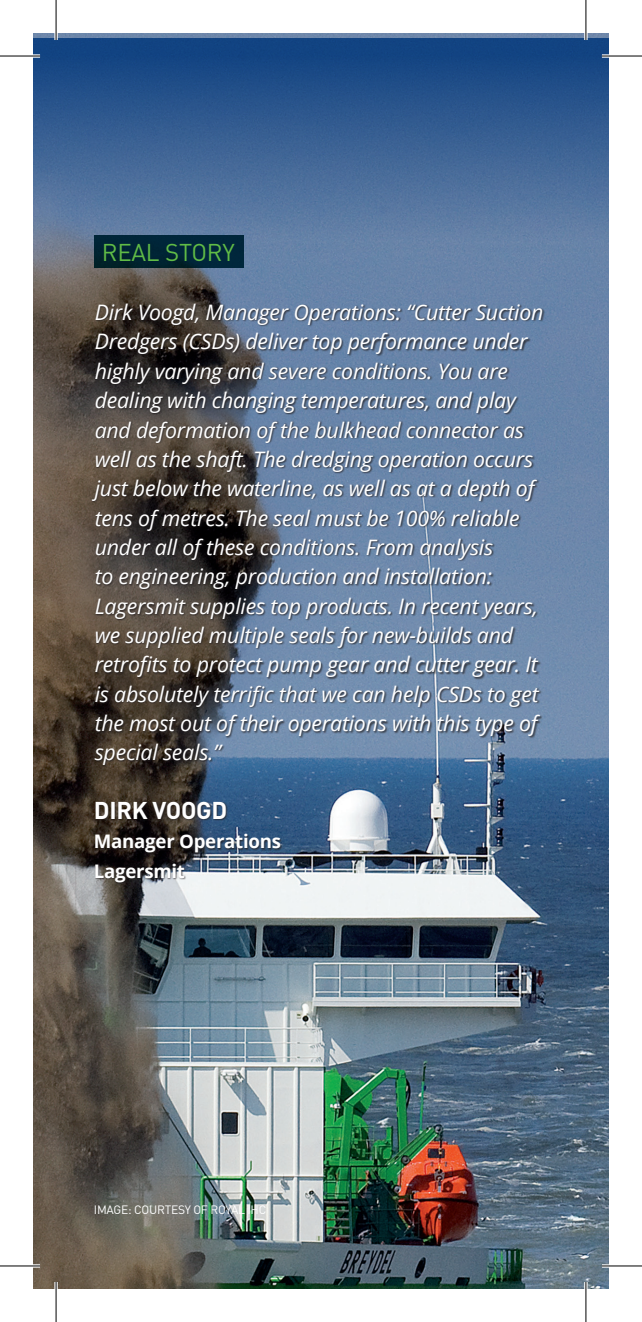


IMAGE: COURTESY OF ROYAL IHC

REAL PRODUCTS

LAGERSMIT®
CUTTER SUCTION DREDGER SEALS

PEACE OF MIND DURING THE CHALLENGING DREDGING CONDITIONS CUTTER SUCTION DREDGERS ARE FACED WITH. THAT IS THE NEXT STEP IN RELIABILTY OF YOUR OPERATION.

Conventional seals are not able to perform under harsh dredging conditions that cutter suction dredgers (CSDs) encounter every day during their activities. For this sole purpose, Lagersmit has developed highly reliable sealing solutions, that can handle extreme bulkhead and shaft deformations.

PRODUCTS

- Cutter Gear Bulkhead Seal
- Pump Gear Bulkhead Seal

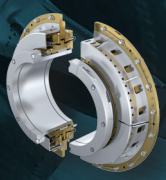
REAL PRODUCTS

LAGERSMIT®
CUTTER GEAR BULKHEAD SEAL

THE CUTTER GEAR BULKHEAD SEAL IS DESIGNED FOR SAFEGUARDING THE CSDs CUTTER GEAR MACHINE ROOM. THE CUTTER GEAR BULKHEAD SEAL IS A PROVEN, HIGHLY RELIABLE SEALING SOLUTION FOR 24/7 DREDGE OPERATIONS. IT IS DESIGNED TO KEEP YOU GOING AND TAKE THE NEXT STEP IN BOTH PERFORMANCE AND RELIABILITY.

CUTTER GEAR BULKHEAD SEAL USPs

- The flexibility and (bearing) support to manage 5 mm of radial displacement
- Minimal wear on lip seals and the support bearing
- Condition Monitoring
- Planned maintenance while minimising risk of sudden failure
- Modular, Made-to-Measure



REAL FACTS

LAGERSMIT® CUTTER GEAR BULKHEAD SEAL

HOW IT WORKS

The Cutter Gear Bulkhead sealing system consists of a floating seal with a protective cover and lubrication system, equipped with all necessary sensors for controlling and monitoring the sealing system. The Cutter Gear Bulkhead seal is installed on large cutter shafts and is mounted on the bulkhead of the cutter gear machine room. Because the cutter shaft generally exists of several flange coupled shafts, the seal is made fully split.

The “floating” seal will follow the radial shaft movement by means of a segment with an integrated white metal slide bearing. This way, conditions for proper static alignment and run-out are met automatically.

All oil and grease connections are made on the inboard side of the seal; no extra passages through the bulkhead are needed.



FLOATING SEAL MECHANISM



OIL LUBRICATED SYSTEM



GREASE LUBRICATED SYSTEM

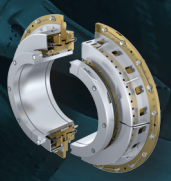
REAL PRODUCTS

LAGERSMIT®
PUMP GEAR BULKHEAD SEAL

THE PUMP GEAR BULKHEAD SEAL IS DESIGNED FOR SAFEGUARDING THE CSDs PUMP GEAR MACHINE ROOM. THIS BULKHEAD SEALING SOLUTION CAN HANDLE LARGE BULKHEAD AND SHAFT DEFORMATIONS AND CAN OPERATE IN ABRASIVE ENVIRONMENTS AT DRAUGHTS OF 16 METERS.

PUMP GEAR BULKHEAD SEAL USPs

- The flexibility and (bearing) support to manage 5 mm of radial displacement
- Pressure compensation
- Zero-emissions
- Minimal wear
- Condition Monitoring
- Operates on great depths (>15 m)
- Modular, Made-to-Measure



REAL FACTS

LAGERSMIT® PUMP GEAR BULKHEAD SEAL

HOW IT WORKS

The Pump Gear Bulkhead sealing system consists of a floating seal with a protection cover and a lubrication system with a Supreme Ventus® system, which is equipped with all necessary sensors for controlling and monitoring the seal. The Pump Gear Bulkhead seal is installed on the underwater pump shaft and is mounted on the bulkhead of the underwater pump gear machine room.

The “floating” seal will follow the radial shaft movement by means of a segment with an integrated white metal slide bearing.
This way conditions for proper static alignment and run-out are met automatically.

All oil connections are made on the inboard side of the seal; no extra passages through the bulkhead are needed.



SUPREME VENTUS SYSTEM



FLOATING SEAL MECHANISM



EXTRA LIP SEAL MODULE

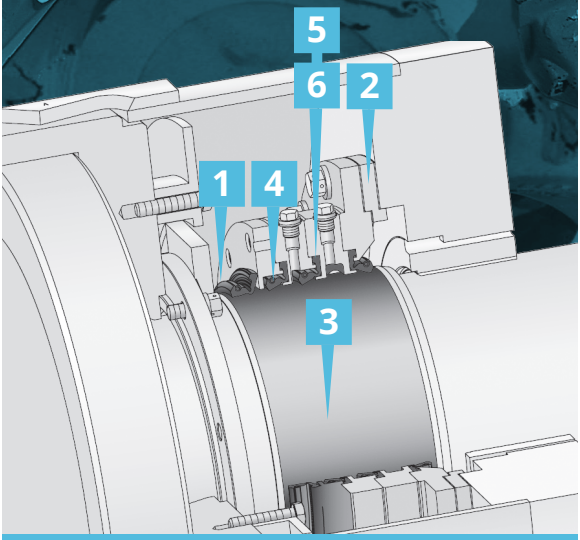


OIL LUBRICATED SYSTEM

REAL PRODUCTS

SUPREME®
OPTIONS

LOOKING FOR THE BEST SEALING SOLUTION
FOR YOUR APPLICATION?
FIND OUT HOW LAGERSMIT CAN ENHANCE
AND CUSTOMISE YOUR SEAL.



REAL PRODUCTS

SUPREME® OPTIONS

1. DIRT BARRIER (L)

Would you like to avoid damage to the aft seal caused by sand and debris? Choose a dirt barrier which also prevents small fishing lines from entering the seal.

2. DISTANCE RING (D)

Looking for a way to extend the lifetime of your chrome steel liner? A divisible distance ring can be added to your Supreme seal. By removing the distance ring during maintenance, the entire seal can be repositioned to create a new running surface for your lip seals.

3. HML LINER COATING (C)

Looking for a way to lengthen the lifetime of your whole seal? A liner with a special hard metal layer (HML) enables:

- An improved liner lifetime.
- Good effective heat transfer, preventing hardening and ageing of the rubber lip seals.
- Decrease docking time and saving costs by not having to machine the liner.

WWW.LAGERSMIT.COM/CUSTOMISED-OPTIONS

REAL PRODUCTS

SUPREME® OPTIONS

4. HASTELLOY® C4 SPRINGS
Looking for lip seal springs that are more resistant to corrosion? Use lip seals with Hastelloy® lip seal springs.

5. FKM LIP SEALS
What is your speed and draught? Depending on your operating conditions we recommend to use FKM lip seals instead of NBR.

6. FKM EAL LIP SEALS
Are you using an Environmentally Acceptable Lubricant (EAL) instead of mineral oil? Our lip seal has an especially developed FKM lip seal compound which ensures more durability when using EALs.

Lagersmit offers extra options regarding net cutters, wire winders and cathodic protection.

WWW.LAGERSMIT.COM/CUSTOMISED-OPTIONS

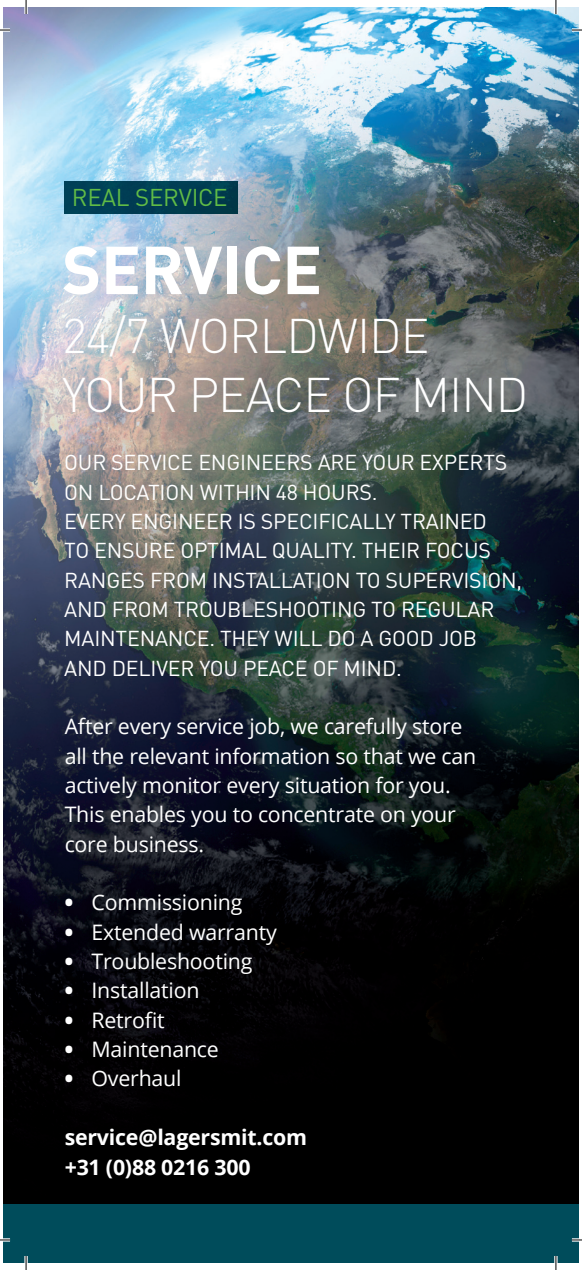
REAL STORY

DEME's German subsidiary Nordsee Nassbagger- und Tiefbau is involved with the expansion of the Port of Cuxhaven in Germany. Niedersachsen ports is planning to build a new terminal area next to the existing Europakai LP3 in Cuxhaven. This new 'Liegeplatz 4' (LP4) will be used for the future freights and offshore wind turbines. The works consist out of reclamation and dredging by Trailing Suction Hopper Dredger (TSHD) 'Marieke'. The ship is equipped with Liquidyne® and Supreme® seals and proves to be the ideal sized TSHD to complete the works within time and budget and in weather circumstances of high wind and strong currents. Furthermore, 'Marieke' has the ideal hopper capacity (5,600 m³) to use a specific designed rainbowing technique to reclaim 1,000,000 m³ of land for the new terminal area, combined with pumping ashore.

KOEN MESTDAGH
projectmanager DEME



IMAGE: COURTESY OF DEME



REAL SERVICE

SERVICE

24/7 WORLDWIDE
YOUR PEACE OF MIND

OUR SERVICE ENGINEERS ARE YOUR EXPERTS ON LOCATION WITHIN 48 HOURS.
EVERY ENGINEER IS SPECIFICALLY TRAINED TO ENSURE OPTIMAL QUALITY. THEIR FOCUS RANGES FROM INSTALLATION TO SUPERVISION, AND FROM TROUBLESHOOTING TO REGULAR MAINTENANCE. THEY WILL DO A GOOD JOB AND DELIVER YOU PEACE OF MIND.

After every service job, we carefully store all the relevant information so that we can actively monitor every situation for you. This enables you to concentrate on your core business.

- Commissioning
- Extended warranty
- Troubleshooting
- Installation
- Retrofit
- Maintenance
- Overhaul

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