



# Seamless Performance

*Upgrade to IMO OptiLine*



# Seal-less Solution Seamless Performance

The introduction of the IMO OptiLine series is already making waves within the marine industry. Innovative technology featuring magnetic couplings drastically reduces wear as well as making oil leakage history. Far from being the negative focus of your engine, IMO OptiLine will simply work as one with it.

## **THE STANDARD APPROACH**

A packing box, a mechanical seal or a lip seal are the most common methods for avoiding leakage around a rotating shaft extending through the wall of a pump. Such seals are lubricated and cooled by the pumped liquid; as a result leakage can always be expected from a traditional mechanically sealed pump.

## **TIMES HAVE CHANGED**

Over the years, the Heavy Fuel Oil (HFO) used for the main engine has become more and more aggressive. To handle higher viscosities, the temperature of the oil has increased. From port to port, the bunker oil that is loaded can also be of very different quality. A bad bunker can break the booster pumps mechanical seal resulting in heavy leakage. These changes have led to increased wear on mechanical seals, primarily in the booster pumps/booster modules. The same shaft seal that 10 years ago only needed replacement every second year, may now have to be shifted two times per year. This means increased maintenance and costs for the vessels.

## **AUTHORITIES REQUIRE CLEAN ENGINE ROOMS**

The SOLAS directive stipulates that there can be no oil close to or on hot surfaces, to avoid fire onboard. Many authorities interpret SOLAS as meaning there can be no oil leakage at all from the booster pumps handling the very hot Heavy Fuel Oil. Some port authorities require completely clean engine rooms before the vessel is allowed into the port. With mechanically sealed pumps, this means repeated cleaning of the engine room to wash out the excess oil coming from lubricating the mechanical seal.

**Magnetic coupling technology resolves the problems – IMO OptiLine has the answer.**



# Invest in a leakfree future

– *upgrade to IMO OptiLine*

A leaking oil pump also leaks money – it's that simple. The solution is IMO OptiLine. Return on investment for an IMO OptiLine pump is often less than three years, after that it will continue to save you money.

#### **THE IMO OPTILINE APPROACH**

With the IMO OptiLine series, there is no shaft extending into the external environment at all. Instead the power from the motor is transmitted via permanent magnets leaving the pumping chamber completely sealed off. The absence of mechanical seals means no leakage. There is no need for cleaning engine rooms of oil from shaft seal lubrication, for replacing worn out seals, or for spending money on maintenance. Once installed, the IMO OptiLine pump will keep pumping for years with practically no associated costs.

#### **HOW DOES IT FIT IN WITH**

##### **MY EXISTING THREE SCREW PUMP?**

Very easily indeed. It is often virtually a drop-in replacement with your current IMO three-screw pump. The result is minimum costs of piping and re-structuring. The replacement can be done in any port with just a few hours stop. The compact design and different flange option makes the replacement of a non-IMO pump a very easy one, with little or no impact on the current piping and layout.



#### **WHY UPGRADE?**

First, and most obviously, the leaks are gone – no messy engine rooms, no wasted man-hours or delays, just solid performance. The greatest benefit is financial; the costs of operating your oil pump have been drastically reduced. From day one, your maintenance costs will be substantially lower. The removal of mechanical seals removes a large part of the problem: with no wear on the parts, there is no need to replace them. For an entire fleet, an IMO OptiLine oil pump could literally save you tens of thousands of Euros. Euros better spent elsewhere!

To find out when your IMO OptiLine will have paid itself back go to [www.imo.se/upgrade](http://www.imo.se/upgrade)

*“The pump has performed admirably, without any problems, 22 500 hours after installation.”*

CHEIF ENGINEER DAVID HOPKINS,  
STOLT-NIELSEN



**THE CLIENT: STOLT-NIELSEN**

**THE VESSEL: STOLT EFFICIENCY**

**THE STORY: IMO OPTILINE WAS INSTALLED IN AN F.O. BOOSTER APPLICATION IN 2004.**

**THE RESULT:** “The pump has performed admirably, without any problems, 22 500 hours after installation,” says chief engineer, David Hopkins.

“The IMO OptiLine magnetic-coupled technology, has substantially increased the reliability and decreased cost and time for maintenance and replacement of shaft seals. At Stolt-Nielsen we are committed to operational excellence. This means that we continuously strive for increased performance at all levels, from human capital to equipment, including pumps.”

**THE CLIENT: STENA LINE**

**THE VESSEL: STENA DANICA**

**THE STORY: DURING SPRING 2008 IMO OPTILINE PUMPS WERE INSTALLED ABOARD THE PASSENGER VESSEL, STENA DANICA.**

**THE RESULT:** 1st Engineer, Johan Sjölander, states, “The constantly leaking pump, and negative inspection reports forced us into looking for an alternative supplier. IMO AB pumps have a good reputation and solid track record in the marine industry, therefore we looked at both IMO AB’s standard pumps as well as the magnetic-coupled alternatives.”

Chief Engineer Hans Corneliusson: “The leak-free operation stated with IMO OptiLine was something that we really would like to evaluate. So far the IMO OptiLine pumps have delivered the promise of truly leak-free operation.”

Stena Line AB actively works with HSE (health, safety and environmental) issues. Further they are certified to the environmental standard ISO 14001.



Left: Stena Danica’s old mechanically sealed pump. Right: Spring 2008 – Stena Danica’s new IMO OptiLine pumps.

# Take a closer look

To really achieve efficiency in pumping oil, we needed a re-examination of how oil was pumped. The challenge was then to remove any problem areas.

The solution: IMO OptiLine.

## FULLY ENCLOSED

The traditional mechanically sealed pump has an inherent design flaw: the pumped liquid is used to lubricate the seal, which results in oil leaking through the seal.

“To avoid this problem, we needed to design a pump with no mechanical seal”, says André Bergström, Chief Technical Officer at IMO AB. “The solution was a pump with a completely sealed pumping chamber”.

Power is transmitted from the motor to the pump’s rotor set via permanent magnets. Instead of the traditional seal and coupling, the rotor shaft is equipped with permanent magnets. The rotor shaft is then sealed inside a non-magnetic can. No oil can leak through this can. On the outer atmospheric side of the can, an outer rotor, also with permanent magnets, is coupled to the driver. With no sliding contact seals, there is no way for oil to escape.

## NO NEED FOR EXTERNAL COOLING

The Magnetic coupling of the IMO OptiLine pump is designed to withstand temperatures of up to 350° without risking function. A small fraction of the pump flow is diverted back into the inner side of the magnetic coupling and then returned to the pump inlet. The minimal loss of flow has no practical impact but removes the heat generated in the coupling. As a result, there is no need for any external cooling, and the connecting frame can be sealed to avoid dust jamming the magnetic coupling on the atmospheric side.

## HIGH TORQUE PERFORMANCE MAGNETS

The magnets in IMO OptiLine pumps are dimensioned and very well suited for the harshest running conditions in terms of high viscosities.

The IMO OptiLine is equipped with steam tracing. This makes it possible to connect the pump to the booster system’s existing heat tracing with steam, hot water or thermal oil.

For further information visit [www.imo.se/upgrade](http://www.imo.se/upgrade)

## Technical data – IMO OptiLine

MODEL	ACE	ACG	UNIT
CAPACITY	0.6–10.8	10–70	M3/H
DIFF. PRESSURE	16	16	BAR
VISCOSITY	1.6–1500	1.6–1500	CST
TEMPERATURE RANGE	-20 TO +180	-20 TO +180	°C
MAX. SPEED	3600	3600	RPM
VALVE BLOCK	YES	NO	

**ENJOY FEWER PROBLEMS**

The traditional mechanical weak points are gone, so is the need to replace them. In fact, there are minimal spare parts or maintenance costs with an IMO OptiLine upgrade.

**LEAK-FREE PERFORMANCE**

Oil leaks, like the associated financial leaks, are gone, and you're left with reliable, worry-free performance.

**EXTREME DUTY**

The optimal solution for Heavy Fuel Oil applications, and designed to maintain high performance at extreme temperatures.

**SAFETY OF LIFE AT SEA**

The IMO OptiLine oil pump is compliant with the SOLAS guidelines and directives.

**HASSLE-FREE CONVERSION**

It is virtually a drop-in replacement with your current IMO AB three-screw pump, keeping the cost of piping and re-structuring to a minimum.



