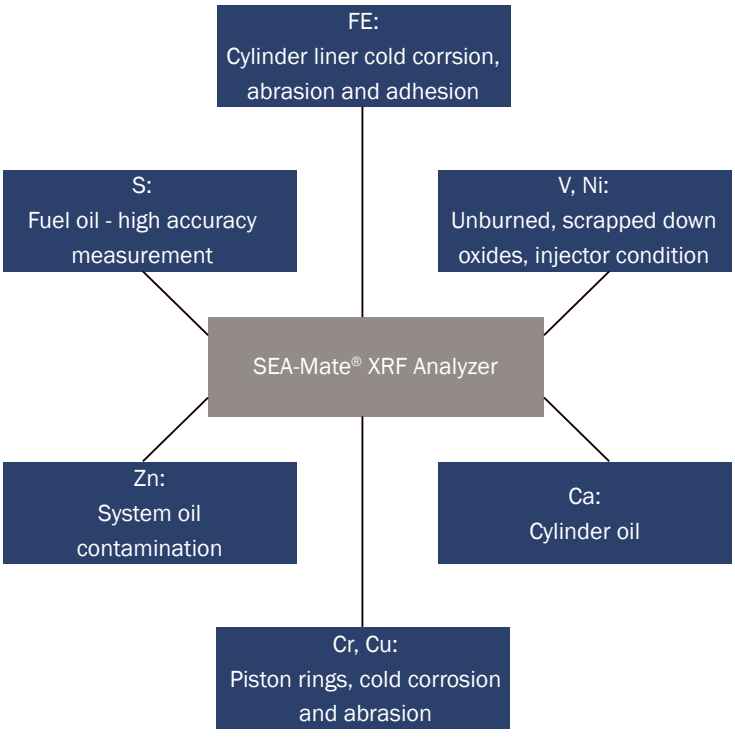
SEA-Mate®
M5000 Analyzer

The SEA-Mate® M5000 Analyzer is based on XRF technology. It is an accurate and easy-to-use on-board or on-site lubricant and fuel analysis tool, to help streamline maintenance management and reduce the net cost of operation and Total Cost of Ownership of your engine. Designed specifically for the maritime and power generation industries, the SEA-Mate® M5000 Analyzer delivers results in minutes, rather than the standard two weeks when using shore laboratory - hereby putting critical diagnostic process control firmly back into your hands. Combined with the SEA-Mate® Blending-on-Board system, lubrication efficiency, total cost saving and reduced oil consumption, will take your vessel to the next level.

SEA-Mate® M5000 Analyzer measures the true and total iron content – abrasive and corrosive



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SEA-Mate® M5000 BENEFITS:

The accuracy and speed of the SEA-Mate® M5000 Analyzer enables you to identify issues before they become a problem:

- X-ray spectrometer allows precise quantification of wear elements inside the cylinder, reducing engine damage and cylinder oil feed rate by enabling immediate crew action.
- The SEA-Mate® M5000 Analyzer allows the measurement of iron originating from cold corrosion, abrasion or adhesion. Unlike many other onboard devices that only measure magnetic iron.
- A special sulfur function, for maximum accuracy to control the effective sulfur content of the fuel oil in use.
- System oil condition monitoring capabilities including the condition of specific components (bearings, gears, camshaft, etc.).
- On-the-spot analysis of how your engine is behaving helps reducing cylinder lube oil consumption and optimize Time Between Overhauls (TBO).
- Mapping of the engine's actual response to fuel sulfur and operational conditions to enable safe setting of optimal cylinder oil feed rate.

ELEMENTS MEASURED AND RANGES:

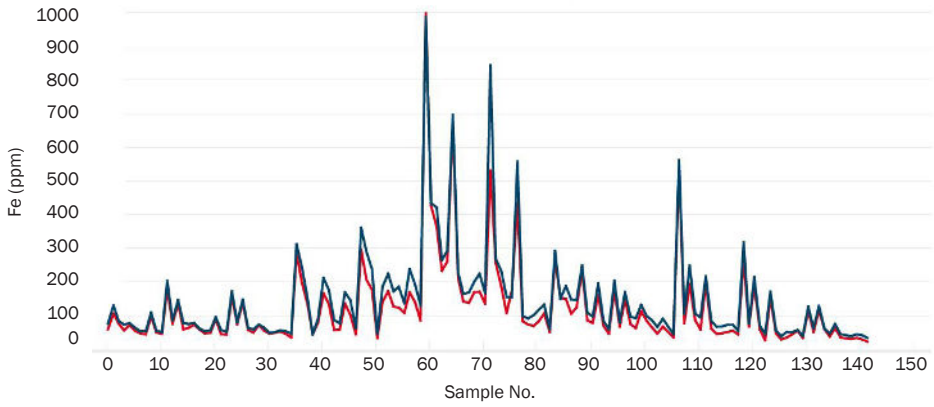
	S	Fe	Pb	Cu	V	Ni	Cr	Zn	Ca
Detection range / PPM	10-30,000	0-5,000	0-1,000	0-1,000	0-2,000	0-2,000	0-2,000	0-10,000	100-60,000

Field Data

Extensive field tests on several vessels and power plants has been carried out. As the graphs show, there is excellent correlation between SEA-Mate® XRF Analyzer results and those from the same sample run at a land-based laboratry.

SEA-Mate®
DNV Norway

Scrape-down oil from MAN B+W 12K90MC - Iron analysis, High Wear Regime



System Specification	SEA-Mate® M5000
Dimension (LxWxH)	*41 x 65 x 37 cm*
Weight	*27 kg*
Ambient temperature	*5-45 ℃*
Sample size	*50 ml*

For more information and contact details, please visit us at www.marinefluid.dk

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SEA-Mate®
Blending-on-Board

Fit-for-Purpose Lubrication

SEA-Mate® Blending-on-Board (BOB) is the environmentally friendly solution, that can reduce CO2 by reducing the overall lubrication consumption onboard by up to 40%, while deliver a fuel saving of up to 1.5%.

Compliance with 2020 Fuel Sulphur cap has brought new challenges for cylinder lubrication.

Function

BOB provides the needed cylinder oil flexibility, by blending a Fit-for Purpose cylinder oil quality onboard.

Simply blend a high BN oil (BN100-400) with used system oil to get the BN needed in the engine to protect against corrosion and provide detergency.

With used system oil being used for cylinder lubrication the engine sump can be refilled with fresh, new System Oil which leads to cleaner oil in circulation with improvement in viscometry's & related improved fuel economy. Cleaner oil will promote cleaner engine crankcases and longer critical component lifetime.

For scrubber vessels, BOB is also a good match, capable of delivering a higher than 100 BN cylinder oil, when required for corrosive-sensitive engines.

Key Features

BOB is designed to produce a finished Cylinder lubricant to a targeted specific Base Number with one switch making it user friendly & simple to operate.

The operator can continuously adjust & optimize the lubricant neutralization characteristics in accordance with the engine requirements & fuel Sulphur content.

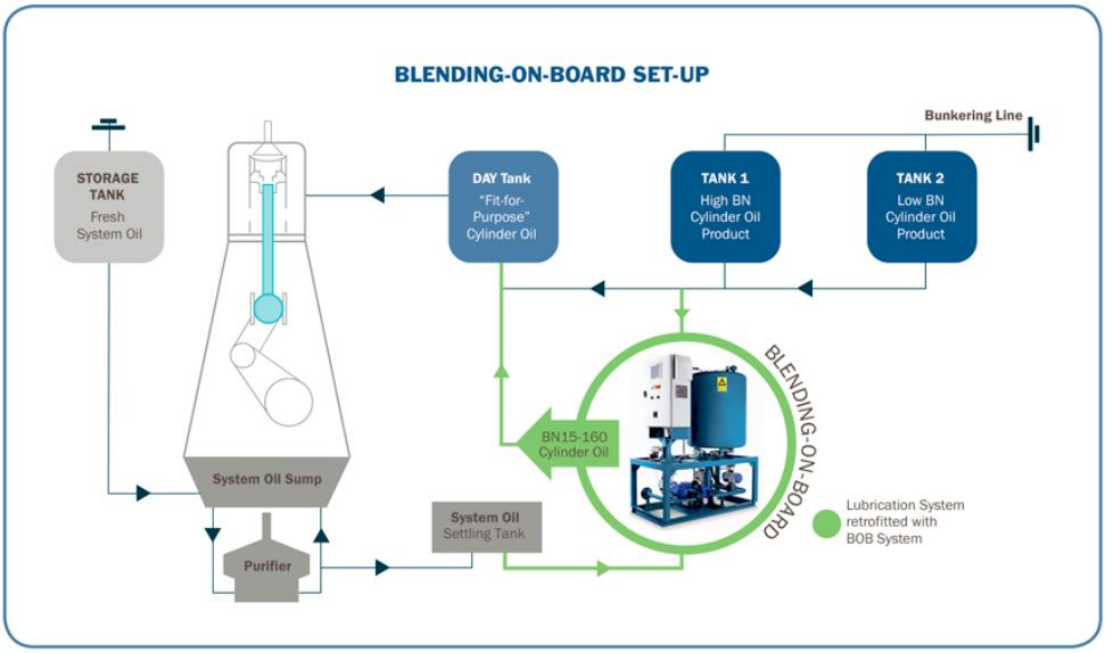
Technical Advancements

- Flexibility to produce Fit-for-Purpose cylinder oil to meet the operating conditions at any time, keeping minimum feed-rate,
- Eliminate cold corrosion and liner bore polishing,
- Continuous renewal of the system oil in operation and improved hydraulic system reliability,
- Reduced friction losses due to correct system oil viscosity

The technology was originally developed by A.P. Moller-Maersk, allows owners to produce a Fit-for Purpose cylinder lubricant onboard, by blending either the in-use system oil with a higher-BN cylinder oil product, which also facilitates the addition of fresh system oil to the engine sump, or by mixing a low BN cylinder oil with a high BN cylinder oil.

SEA-Mate® Blending-on-Board System has been type approved by Lloyd's Register.

SEA-Mate®
Blending-on-Board



Product and Technical Specifications

Performance	SEA-Mate® B500Mk2	SEA-Mate® B1000Mk2	SEA-Mate® B3000
Ingoing cylinder oil product range (BN)	40-400	40-400	40-400
Blended cylinder oil output (BN)	40-160	40-160	40-160
Standard deviation range (BN)	+/- 2	+/- 2	+/- 2
Blending capacity (ltr/workday)	0-300	0-300	0-2000
Streams that can be blended	3	4+	4+
Operation	Semi-automatic	Semi-automatic or automatic with multiple options for signal input	Semi-automatic or automatic with multiple options for signal input
Technical			
Working temperature (°C)	5-50	5-50	5-50
Dimensions (L x W x H, cm)	110 x 60 x 85	110 x 60 x 85	130 x 70 x 170
Weight (kg)	170	170	350
Power requirement:	3x 440V / 6A	3x 440V / 6A	3x 440V / 10A

Financial Benefits (ROI)

- Reduced cylinder oil consumption when running minimum feed-rate and adjustable cylinder oil BN,
- Increase TBO and reduce maintenance cost,
- Reduced energy consumption and thereby fuel savings,
- Reduced system oil losses due to having cleaner system oil

Return of investment **Between 6-8 months**

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