

# SEA-Mate® Blending-on-Board & SEA-Mate® CJC™ Filter System

For exceptional 2-stroke main engine lubrication oil quality

In connection with SEA-Mate® Blending-on-Board, a new unique SEA-Mate® CJC™ 2-stroke main engine filter has been developed. The combination of Blending-on-Board and the new 2-stroke main engine filter has been field tested for more than 6 months and the system delivers superior system oil cleanliness, as per OEM requirements.

The details of the test conditions were as follows:

- Engine type : Wärtsila 14RTFLEX96-C - 80,000 kW
- Main Engine system oil volume : 80,000 litre
- SAE30 main engine system oil
- 15% of the main engine system oil sump changed/month and applied as base oil for cylinder oil blending
- Initial condition: SEA-Mate® Blender & centrifugal separator in continuous service for 3 years
- Test condition: SEA-Mate® Blender & introduction of SEA-Mate® CJC™ Filter system in continuous service

Four performance categories were monitored and examined and the conclusions were clear: By combining the Blending-on-Board process with the 2-stroke main engine filter, users can maintain outstanding system oil cleanliness. The results were at least as good (or sometimes better) as those achieved by the Blending-on-Board & centrifugal separator system.

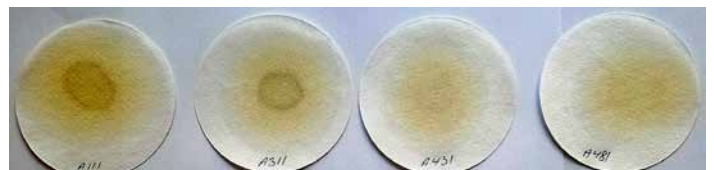
The results prove that 2-stroke engine operators can reduce the operational cost by USD 35,000 – USD 150,000 per year depending on engine type.

## 1. Particles and water

	Centrifugal separator system (Continuous service with Blending-on-Board system)	SEA-Mate® CJC™ Filter system (20 weeks in continuous service with Blending-on-Board system)
<b>Particles – ISO CODE 4406</b>	22/19/12 22/18/12 22/17/13	22/16/12 21/16/12 22/16/12
<b>Water</b>	<0.1 %	<0.1 %
<b>Iron [mg/kg]</b>	10.8	3.2

Both particles and iron content were reduced by using the SEA-Mate® CJC™ Filter system, delivering results and performance at least as good – or better – than using the centrifugal separator system.

## 2. Blotter spot test



Centrifugal Separator

18 weeks using the CJC™ filter system

In only 18 weeks, the dark center found in the blotter spot tests gradually disappears, indicating that soot particles and oxidation products have been removed. This shows that the Blending-on-Board process and SEA-Mate® CJC™ filter gives results that are comparable with using new oil.

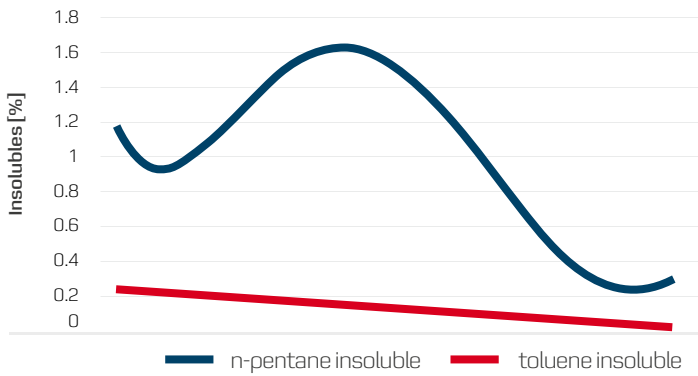


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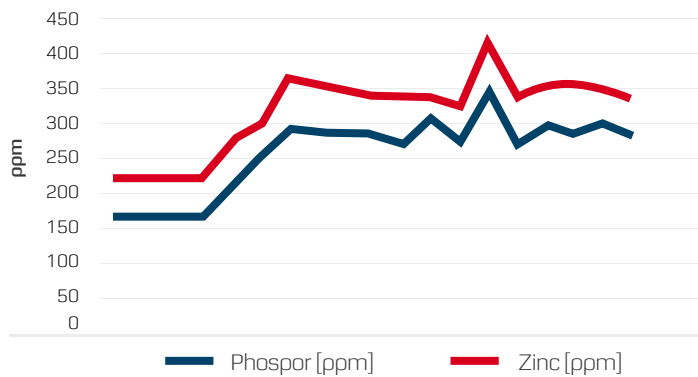
### 3. Oil insoluble contamination



**Centrifugal Separator** → 20 weeks using the CJC™ filter system

The area between the red and the blue curves represents soft particle contamination, such as resinous and oxidation degradation products as well as asphaltenes. **The distinctive variation indicates an extraordinary improvement of engine crankcase system oil shortly after using the SEA-Mate® CJC™ fine filter system.**

### 4. Anti-wear additives (ZDDP Additives)



No Blender system → Blender introduced → SEA-Mate Blending and CJC™ Fine Filter system

The ZDDP anti-wear additive is a crucial performance parameter for the lubrication oil by enhancing its load bearing capacity. When starting Blending-on-Board, the ZDDP additive increased almost 100% (which is similar to new system oil). By using the SEA-Mate® CJC™ Filter, high concentration of ZDDP levels are maintained due to oil refreshment as well as reduced friction and wear.

### 5. Financial savings

The achievable amount of financial savings depends on several factors, such as engine size (number of cylinders and bore-size), lube oil sump size, system oil contamination, present centrifugal separation operation and so forth.

However, savings can realistically range between USD35,000 up to at least USD150,000. This is attributable to:

- Elimination of energy used for running present centrifugal separator
- Elimination of energy used for heating the system oil for centrifugal separator operation
- Zero loss of system oil due to centrifugal separator oil discharges
- Spare parts and employee resources
- Reduced risk of water contamination from centrifugal separator

### Conclusion

The tests clearly show that by combining the SEA-Mate® Blending-on-Board with the SEA-Mate® CJC™ Filter, you can maintain exceptional levels of cleanliness for your system oil. The results are at least as good as using the centrifugal separation technique and on a number of performance parameters they are even significantly better.

The financial savings this offers leads to one conclusion – switching to SEA-Mate® Blending-on-Board and SEA-Mate® CJC™ Filter for 2-stroke main engine lubrication is the best decision for your engines, your vessels and your business.

For more information, please visit us [www.maerskfluid.com](http://www.maerskfluid.com)



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