



## CASE STUDY

# GASTOPS OCCM IN MARINE DIESEL ENGINES

Gastops has developed a brand-new Oil Condition and Contamination Monitor (OCCM) which uses fluorescence spectroscopy to directly measure oil condition and contamination at the molecular level.

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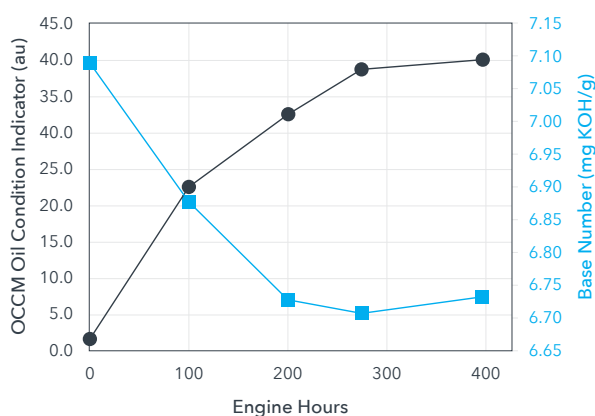
### Background

Oil samples were collected from marine diesel engines operating within a major fleet, and results from these real-world oil samples provide an indication of the efficacy of the Gastops OCCM. The engines are Caterpillar C32 Marine Diesel engines and are operated with Mobilgard HSD+ 15W-40 engine oil.

## Conclusion

Oil samples were collected from six operating engines, with a sample frequency of approximately 100 operating hours per sample. During the phase of testing covered by this study over approximately 100 days, a total of 46 samples were analyzed from all engines. One specific engine was the focus of increased sampling, resulting in 17 data points spanning multiple engine oil changes over approximately three months of operation.

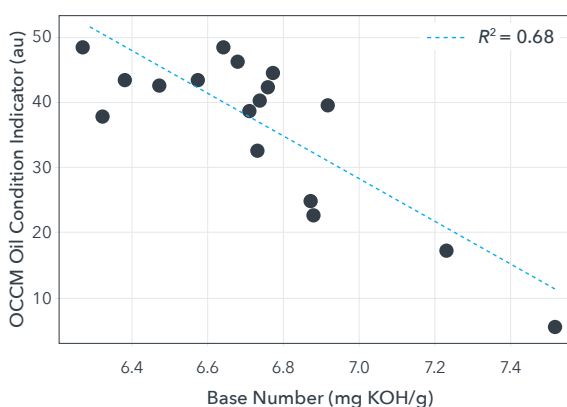
For these oil samples the OCCM Condition Indicator (CI) and the oil Base Number (BN) were measured. Results from the analysis of the Mobilgard HSD+ 15W-40 field samples are shown below:



Subset of BN vs. Gastops OCCM CI for one equipment oil change interval

As expected, there is strong agreement between the measurements taken by Gastops OCCM and the lab-based Base Number method. Samples in the data set are spaced approximately 100 engine running hours apart.

When correlating the values reported by BN with the Gastops OCCM CI number for the same oil sample, a linear trend emerges. The below image illustrates this trend.



BN vs. Gastops OCCM CI for the field samples of Mobilgard HSD+ 15W-40

From the image, a linear relationship between the two technologies is apparent, indicating a strong agreement between the Gastops OCCM technology and the lab-based analysis.

By advancing this technology, Gastops' new sensor will allow a continuous, real-time measurement which correlates to Base Number, allowing online oil condition to be measured directly with no need for oil sampling.



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