

# VISCOpro 2000 monitors and controls heavy fuel oil on shipping vessels



Photo courtesy of Maersk.

## RESULTS

- Eliminated the need for shipboard modifications to install the viscometer
- Prolonged the service life of injectors, fuel pumps and filters
- Reduced stack emissions
- Improved waste heat boiler/economizer efficiency.
- Reduced deposits in the scavenging air box
- Improved combustion with accurate viscosity measurements, which helped to:
  - Reduce the number of planned maintenance shutdowns
  - Reduce the number of unplanned maintenance shutdowns

## APPLICATION

Online viscosity measurement and control of heavy fuel oil

## CHALLENGE

Maersk is a global shipping company with a diversified fleet of crude oil, product, and gas tankers. On many of its vessels, it uses viscometers to measure the viscosity of the heavy fuel oil that is used to operate outside of port. Precise viscosity measurement of the fuel oil enables the ships to achieve proper combustion in its engines, which improves operation, decreases maintenance, and reduces the impact to the environment.

Maersk needed to replace older-generation viscometers on three of its vessels. It was important for the company to find a supplier who could deliver on three requirements.

First, they needed a solution that could be implemented without any modifications to the ship. Second, they needed a viscometer with a very wide measurement range for extreme accuracy. Third, they needed a very fast delivery to accommodate the ship's arrival into port and planned maintenance schedule.

## SOLUTION

Cambridge Viscosity (CVI), a PAC brand, engineered a viscometer solution that met Maersk's requirements, including the fast turnaround time.

The VISCOpro 2000 in-line viscometer automatically measures the viscosity of the heavy fuel oil, enabling ship operators to properly adjust the operating parameters so combustion takes place at peak efficiency.

“When existing system manufacturers required long lead time and extensive manifold modifications to replace obsolete equipment Maersk Line limited approached CVI, with their proven track record in design and execution of viscosity control systems. CVI was able to design, manufacture, install, and commission a replacement set up within a limited timeframe without any shipboard modifications that would have been necessary to accept the then current OEM replacement. Since then the CVI product has proven its reliability that it is now considered the only replacement option for sister ships.”

~ Steve Gallacher, Maersk Vessel

Designed with oscillating piston technology, the VISCOpro 2000 delivers accurate, repeatable measurements. It also features a robust design and high vibration tolerance, and has minimal maintenance needs, making it ideal for a floating vessel.

In addition to using viscosity measurements to optimize the combustion process, Maersk also monitors viscosity of the oil during the changeover process from heavy fuel oil to diesel fuel. In many cases, vessels are required to use diesel fuel while in port. By using the VISCOpro 2000 to monitor the viscosity of the heavy fuel oil when switching to diesel, Maersk is able to maintain proper operation even as the properties of the fuel oil change. This capability is also helpful during preventative maintenance procedures, when the vessel's engines may need to be shut down for work on the fuel system.

### **VISCOfuel Firmware Simplifies the Changeover from Heavy Fuel to Diesel**

One of the reasons Maersk selected the VISCOpro 2000 is due to its optional, specialized VISCOfuel firmware. The VISCOfuel firmware is designed to optimize oil combustion and includes an Auto Ramp feature that is specifically for fuel changeover.

The VISCOpro 2000 viscometer captures data on viscosity, temperature, and temperature-compensated viscosity on an easy-to-read visual display panel. Operators can enter the known density of the fluid to change the system display to Kinematic units when necessary. Plus, 13 factory-preset measurements, ranging from 0.2-20,000 cP, are available for improved accuracy and process viscosity control. Maersk's fuel oils are typically in the 2.5-50 cP ranged pistons.

For more information about the VISCOpro 2000, visit us online at [www.paclp.com](http://www.paclp.com).



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