

VISCOMAR™ VISCOSITY METER



DESCRIPTION

Knowledge of oil viscosity is important for storage, handling and combustion. The VISCOMAR Viscosity Meter is a patented electronic instrument designed to accurately measure the viscosity of multiple grades of fuel and lubricating oil.

The VISCOMAR provides shipboard engineers the ability to accurately determine the fuel viscosity during the bunkering operation, assuring the grade of fuel being pumped onboard matches the fuel purchase specification. Random fuel samples taken from tanks or the transfer system can also be tested at any time.

Viscosity measurement with the VISCOMAR is based upon the falling ball principle, using precisely calibrated steel balls for viscosity measurement in the range of 3 -999 mm²/s or centistokes (cSt) at 40 °C and 25-999 mm²/s or cSt at 50 °C and 80 °C. Using a flux-field microchip measuring technique to produce laboratory-quality accuracy and repeatability, the unit is capable of measuring fuel viscosity at three standard temperatures; 40°C (distillate fuel and lube oil), and 50°C and 80°C (residual fuel).

After completion of viscosity measurement, the unit's memory can store up to 9 values, which can be used to calculate the average value. Using the measured value, the CALCUMAR™ control unit enables calculations to be made using viscosity, density and temperature (manual input) to determine important values such as fuel ignition quality (CCAI and CII). The multi-temperature viscosity measurement capability allows calculation of the fuel viscosity index for determining optimum injection temperatures, fuel blending ratios and minimum transfer temperatures.

The CALCUMAR control unit also allows conversion to other viscosity units of measure, as well as calculated viscosity values at different temperatures.

VISCOSITY

Viscosity is a measure of a fluid's resistance to flow and is a vital factor in managing fuel and lube oil onboard ship. Since oil is a Newtonian Fluid, its viscosity has an inverse relationship to temperature; an increase in temperature lowers the viscosity of fuel and lube oil.

While the ISO8217 specifications provide broad criteria for marine fuels, viscosity still determines the grades at which fuel is produced, traded, purchased, stored and consumed. It is common practice to purchase fuel on the basis of viscosity, and at times, it is the only criteria used.



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High viscosity fuels require sufficient heat to remain pumpable, especially in cold climates. Therefore, it is important to ensure the viscosity of the fuel delivered is within the vessel's handling capability, as well as suitable for burning in the engine.

Viscosity is also important in determining the correct injection temperature needed to maintain optimum combustion efficiency in diesel engines and boilers. Engine fuel injectors and boiler burner tips are designed to achieve a specific oil droplet size that will burn completely. If the viscosity is too high, injected fuel droplets will be too large and result in incomplete combustion, smoke and exhaust system deposits. Additional heating of heavy fuel oil is often required to lower its viscosity to the engine manufacturer's specifications.

Viscosity is one of the parameters used in determining the ignition quality of fuel. With the known density and the viscosity reading from the VISCOMAR, the CALCUMAR calculator attachment can be used to determine the Calculated Carbon Aromaticity Index (CCAI) of heavy fuel oil and the Cetane Index Indicated (CII) of distillate fuels.

Viscosity controls the thickness of the lube oil film under hydrodynamic conditions of two opposed metal surfaces sliding over each other. Under microscopic examination, these metal surfaces are irregular, which creates resistance to the sliding action. When lube oil is applied to the surfaces, it fills the depressions and creates a continuous film that makes the sliding action easier. A change in the lube oil viscosity may be an indication of oxidation or contamination by fuel oil, which will reduce the effectiveness of preventing metal-to-metal contact.



Contact your Drew Marine representative for more information

HEALTH AND SAFETY ADVICE

Do not smoke or use petroleum distillates near an open flame. When using, wear protective equipment e.g., safety goggles and gloves. Avoid contact with skin, inhaling vapors, mists or fumes during use. Use in a well ventilated area.

ORDER INFORMATION

FO VISCOMAR™ Test Box Complete (PCN 8552383).

The VISCOMAR includes the VISCOMAR Tester and CALCUMAR™ control unit; 3 viscosity measuring balls and measuring gauge; and 2 calibration reference oils for a viscosity measuring range of 3-999 mm²/s (or cSt) at 40 °C, 50 °C and 80 °C.



Contact your Drew Marine representative for more information

Drew Marine maintains Safety Data Sheets on all of its products. These documents contain health and safety information for the development of appropriate product handling procedures to protect your employees. Safety Data Sheets should be read and understood by all of your supervisory personnel and employees before using Drew Marine products.



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