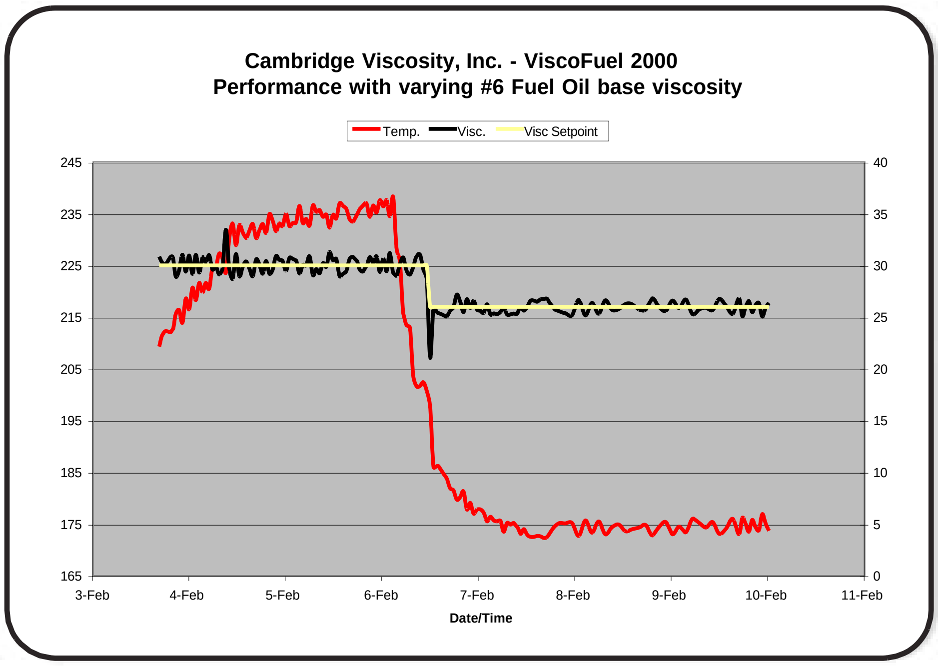
Cambridge Enhances Fuel Viscosity Controller



This graph illustrates the performance of the VISCOfuel 2000 at a steam plant located in Boston, Massachusetts, U.S.A. The plant maintenance superintendent evaluated the VISCOfuel 2000 and in addition to providing viscosity control, the system was able to indicate variations of the viscosity index of the fuel oil supply. Actual batch-to-batch variations in viscosity index are illustrated by the extreme fluctuations in the temperature required to maintain the viscosity set point.

There have been several stages of development in the industry approach to controlling the viscosity of heavy fuel oils. First, plant operators were expected to maintain proper viscosity by controlling fuel oil temperature. This required operators to determine the proper temperature control set point that would yield the correct viscosity for a given grade of fuel oil. Oil manufacturers developed viscosity vs. temperature tables for the various grades of fuel to assist operators in determining the proper set point. These tables allowed for an engine manufacturer's specified viscosity range for proper combustion to be cross-referenced with the temperatures that would yield that viscosity range.

A problem with this method is that fuel oil viscosity/temperature tables are based on expected values for the various blends of heavy fuel, not the actual fuel oil batch that is to be burned. In reality, the viscosity index for heavy fuel blends varies considerably from batch to batch. These batch-to-batch variations of viscosity index make it impossible to maintain proper viscosity control with one specific temperature set point. This is even more difficult for applications that burn natural oil biproducts or waste oils where specifying a viscosity grade is not an option.

The industry has realized that all heavy fuel oils are not created equal and that in order to achieve optimal combustion, the variability of heavy fuel viscosity needed to be controlled. The result of which was the use of in-line viscometers in the heavy fuel oil combustion process.

In-line viscometers are the 'cruise control' of heavy fuel viscosity management. Operators simply enter a control set point and the viscometer maintains it even if the viscosity index of the fuel oil supply increases (up hill) or decreases (down hill) compared to the specification.

Cambridge Viscosity, Inc. (CVI), Medford, Massachusetts, U.S.A., has designed the VISCOfuel 2000 as a simple, rugged system that provides virtually maintenance-free operation, as well as an intelligent approach to fuel oil viscosity control. The sensor is constructed of stainless steel and does not require any seals or mechanical linkage. The system's built-in microprocessor stores calibrations, as well as adjustable control parameters to provide features such as self-cleaning operation and automatic response to system failure. CVI's principle of operation is based on a simple electromagnetic technology. A flow deflector continuously diverts a small portion of the fuel stream (1 ml) into the measurement chamber. Two coils place a constant electromagnetic force on the piston, drawing it up and down within the measurement chamber. A built in RTD measures the actual temperature in the measurement chamber. Proprietary circuitry analyzes the piston's two-way travel time to provide a direct measure of fuel oil viscosity.

The VISCOfuel 2000 also features software designed specifically for fuel oil combustion applications. In May 2003, Cambridge released its latest version of fuel oil control software. The new version offers an improved user interface, as well as a number of new features such as automatic switchover from viscosity control to temperature control and viscosity displayed in units of Saybolt Seconds Universal (SSU) or Centistokes (cSt). The unit also incorporates an enhanced self-cleaning operation of sensor, streamlined menus and a maximum operating temperature that has been increased from 190º to 370ºC.