

A Real Time Viscometer for Industrial Applications

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Viscosity measurements are significantly important in various fields in industry and research. These viscometers are specified as either portable or stable manner. Most of the Stable viscometers can be used only in laboratory environment and are difficult to use in robust industrial environments. Majority of portable rotational viscometers are calibrated viscometers which are using standard Newtonian fluids and accurate laboratory procedure for the calibration process. However, the available viscometers are much expensive.

The objective of this project was to design and fabricate an inexpensive, real time viscometer that could be used in industrial as well as in laboratory environment. Mainly a simple DC motor is used to design this viscometer. Torque constant of DC motor and acquired current was measured. Repulsion torque resulted by spindle rotation is measured. As a result, an absolute value of the viscosity is calculated and displayed. Since the viscosity is calculated using the repulsion torque, viscosity of the non-Newtonian fluids also can be measured by designing a suitable spindle. Series of spindles were designed to increase the sensitivity. Some of the spindles were designed to measure the absolute viscosity even in the portable conditions.

This device can be operated by unskilled persons due to the user-friendly interface of the control panel. All the readings and results can be taken as a computer output through RS 232 port. Further, software can be developed to give out a graphical output. This constructed viscometer gives readings with considerable accuracy compared to the standard temperature-viscosity tables. It is a valuable instrument with many industrial applications.

Key words: Viscosity, Viscometer, Newtonian fluids, RS 232 port