



BROOKFIELD CELEBRATES 80 YEARS WITH NEW DV3T RHEOMETER

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Brookfield Engineering is 80 years young! That's right; the company that standardized the measurement of viscosity with the original Dial Reading Viscometer (see Figure 1) is more innovative than ever. In keeping with founder Don Brookfield's priorities (to offer the "highest quality instruments at the lowest possible price" – see Figure 2), the company has launched the revolutionary DV3T Rheometer which incorporates the latest electronics industry display technology with many "smart" operating features.



Fig. 1: Dial Viscometer

Note that rheometers, as we know them today, did not exist in the 1930s. Measurement of viscosity was done with a single rotational speed instrument. An array of spindles with discs of variable diameter at the bottom could be interchanged. (See Figure 3) The spindle that provided an on-scale torque reading was then specified in the test method. The torque scale on the original instrument went from approximately 700 to 7000 dyne-cm. A look up table for each spindle would convert the torque reading into a viscosity value in the scientific units of centipoise. My goodness, how times have changed!

Phenomenal advancements in the latest generation of rheological instruments for measuring both viscosity and yield stress are epitomized in Brookfield's DV3T Rheometer. (See Figure 4) User interface with touch activated screens easily accesses built-in libraries of reference information on test methods. Controlled user access and data security, which are required to comply with standards such as 21 CFR Part 11 in the US Federal Register, are standard features. Both simple and complex tests can be programmed in standalone mode and can execute automatically without direct operator involvement to monitor data output.

Significant mistake-proof capability has been incorporated into this new generation of Rheometer, so much so that the laboratory bench top now has a host of time saving and error reduction opportunities that cannot be

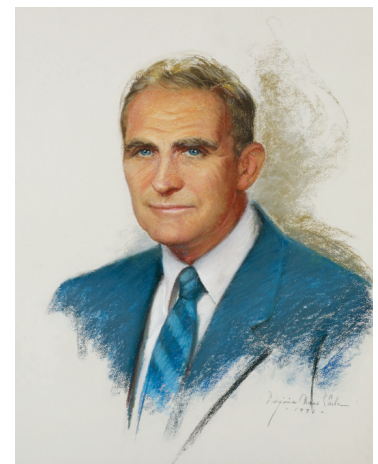


Fig. 2: Portrait of Don Brookfield, Sr.

overlooked. Both QC and R&D benefit because they can now use the same instrument. First, productivity gains are measurable. Second, there are no more operator mistakes because the rheometer controls the test. Lab techs can handle growing sample volume throughput. The addition of extra tests to measure yield stress is possible because they can be programmed sequentially with the viscosity tests afterwards. For materials like sealants and adhesives which need to hold their shape, creep behavior can also be assessed. So the bottom line is a clear return on investment that guarantees payback within the first year of operation.



Fig. 3: Spindle Set

Connection to a computer had been necessary in the past, but is negated by the built-in computer within the DV3T. When R&D creates test methods, they can automatically be transferred to QC with the convenient use of thumb drives. The ability to capture and export data from this new generation of instruments, using the com port connected to a local data network or the USB port connected to a thumb drive, is a significant breakthrough. The latter feature enables test results to be recorded in remote locations on the plant floor and transmitted via the thumb drive when time permits to a central lab for record keeping.



Fig. 4: DV3T Rheometer

Viscosity and yield stress test data appear live on the screen in graphical format with the added benefit of superimposed QC limits when desired. (See Figure 5) Visual inspection allows acceptance or rejection of the product at a glance. The instrument by itself can actively monitor the measured viscosity and yield stress values and report whether the data falls between allowable QC limits established by the user. Windows for data acceptability on the graphical screen automatically show whether the test passes or fails. Interpretation of results therefore becomes automatic and provides the operator more time for other responsibilities.

These performance improvements can actually streamline viscosity tests in terms of the time required to execute. The market price for this type of rheometer is typically under \$5,000. R&D can easily afford the purchase to do the initial method development. QC can also afford to buy the same unit due to its productivity.

R&D will generally specify a test temperature when developing a new test method. The new generation of rheometer can manage temperature conditioning requirements by not allowing the test to proceed until the test sample is at the specified temperature. In fact, the DV3T Rheometer has the capability to control the apparatus, like the Brookfield Bath or Thermosel, which provides the temperature control.

Don Brookfield had little idea that his simple single-speed viscometer would grow into a DV3T Rheometer. However, his belief in innovation and providing value to the customer were the seeds planted firmly at the beginning. That philosophy has not changed. Consequently, the DV3T is a simple, yet elegant, instrument that makes an accurate single-speed viscosity measurement, while offering the capability to do a lot more when needed.

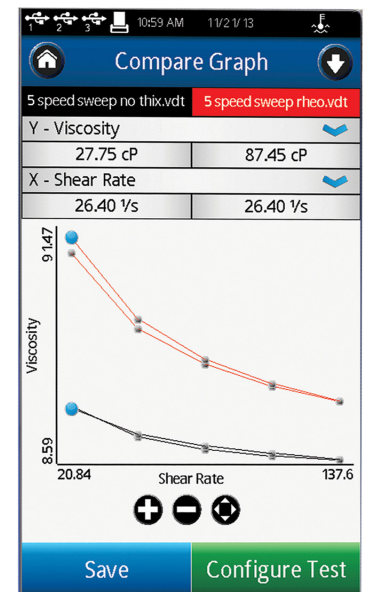


Fig. 5: DV3T Screen Graph