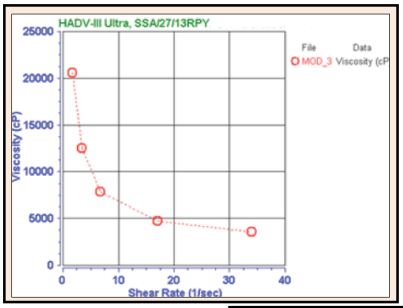
Packaging Materials, Viscosity, and Texture Analysis

What does packaging have to do with viscosity or texture analysis? R&D Managers worry about how customers perceive their food products. They measure viscosity to certify proper flow behavior for sauces and dressings (see Figure 1) and texture to make sure that the chewing action feels right for cookies and crackers. But why be concerned about the containers these products go into or the shipping boxes? Very simply, the adhesives, inks and coatings



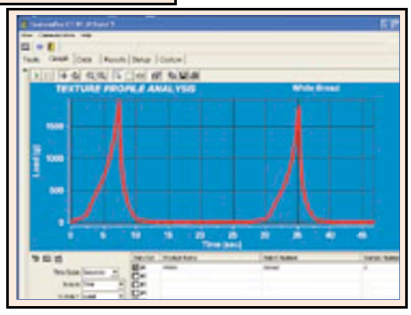


Figure 1 / Viscosity Flow Curve for Sauces and Texture Profile Analysis Curve for Cookies.

used for these packaging materials also require viscosity measurement and control to provide durable attractive products that will serve the food manufacturer well. And the ease with which the consumer opens the package is measured by a Texture Analyzer.

Figure 2 / Standard Benchtop Rotational Viscometer for Packaging Materials

The viscosity issue is the same for all types of materials. Be it an ink or an adhesive, the consistency of the material is ensured by measuring its viscosity. A rotational benchtop viscometer is the tool of choice (see Figure 2) and provides a quick pass/fail indicator once the measurement is made. Normally a specification already exists for the spindle, rotational speed, time of rotation, operating temperature, torque range and sample volume. If there is no spec, then one is created, based either on supplier information or from a characterization test run by R&D on the ink/adhesive.

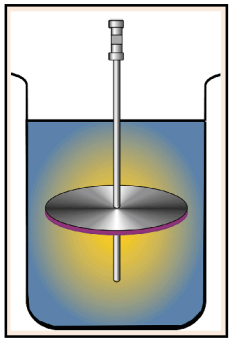


Figure 3 / Standard Disc Spindle in 600mL Beaker

Spindle selection is one of the decisions that must be stated in the spec. Whereas the food item can oftentimes be measured with a standard disc spindle in a 600 ml beaker (see Figure 3), the adhesive or ink necessitates working with a smaller sample volume. Consequently, the Small Sample Adapter(tm) or Cone/Plate is appropriate for making the viscosity measurement since they require only 16mL and 0.5mL respectively. (See Figure 4)

Figure 4 / Cone/Plate Spindle Geometry for Measuring Viscosity of Small Sample Volumes

For some adhesive materials, such as hot melts, the viscosity measurement is made at elevated temperature. The Thermosel(tm) System provides the rapid heating capability to test small sample sizes quickly and efficiently for viscosity. (See Figure 5)

Figure 5 / Thermosel System for High Temperature Viscosity Measurement of Hot Melt Adhesives

One final issue is the tear strength of the packaging material itself. There's nothing worse than a packaged food product which either opens too easily (suggesting the seal was not complete) or

Figure 6 / Texture Analyzer with Dual Grip Assembly Measuring Force Required to Pull Apart Packaging Seal

requires the strength of Hercules to pull apart. The solution is to evaluate the seal strength of the packaging material with a Texture Analyzer. (see Figure 6)

In today's competitive economy, the small details can move the consumer toward one food product vs. another. Pay attention to both the packaging and the food product contained inside by performing these simple tests that will guarantee top quality in all respects.

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