

Improving your Quality While Doing More Inspection for Fewer Dollars!



Food Quality Labs are constantly pressed to run more tests on ingredients and finished products so that customer expectations for “mouth feel” are consistently met. Whether it’s the creaminess of a yogurt, the snap of a cracker, the smoothness of peanut butter or the crunch of a chocolate candy bar, there are physical tests for viscosity and texture that have a direct bearing on acceptable mouth feel for these products.

So how do busy Food Labs keep pace with the testing demands that accommodate all the existing products and allow for inclusion of the new formulations that require, perhaps, more intensive evaluation to establish test methodology? The clear answer is automation where possible. This means upgrading test instruments with current models that can run without operator involvement once the sample set up is accomplished. The data generated by the instrument needs to provide final “go/no go” values that take decision making and interpretation out of the operator’s hands.

Figure 1: Chocolate Viscosity Test System includes Brookfield DV-III Ultra Rheometer with Small Sample Adapter and Temperature Bath



Chocolate manufacturers are a good example. They test the viscosity of many samples per day at elevated temperature and run a data analysis program call “Casson Math Model”. The optimal equipment set up is shown in Figure 1. “Optimal” means that the system runs the test automatically, once the sample is placed in the chamber.

The actual viscosity test does not commence until the chocolate sample reaches the specified elevated temperature. Firmware in the DV-III Rheometer controls the temperature bath to make this happen. Once the spindle starts rotating, the viscosity values are captured automatically to provide the information shown in Figure 2. The instrument has firmware which analyzes this data and provides two final numbers, yield stress and plastic viscosity. These values must fall within established limits for the test to pass.

Figure 2: Casson Analysis For Viscosity Data on Chocolate Sample

Payback using this test setup is easy to calculate. If a lab runs 10 or more tests a day and each test takes a minimum of 10 minutes, the time requirement for an operator to attend the instrument is 100 minutes or more. This conservative estimate says that an hour and a half could be saved each day if the test could run automatically. Multiply this by 250 work days per year and the time requirement is almost 400 hours. The hourly cost for a lab technician tells you that payback for the system shown in Figure 1 (Rheometer, Software, Small Sample Adapter) is 3 to 4 months.

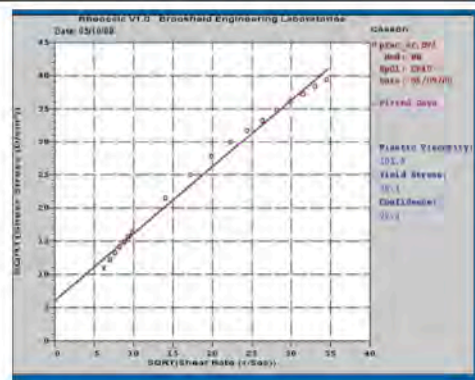


Figure 3: Brookfield CT3 Texture Analyzer with Three-Point-Bend Test Fixture for Snap Test on Crackers



A second example is the snap test for crackers to make sure that they have the proper strength to both hold together as well as break apart when a certain force level is applied. The instrument in

Figure 3 accomplishes this type of test and provides a readout in grams of force required to snap the cracker in two. This type of test has value from the standpoint that crackers are sometimes under- or over-baked. Use of the Texture Analyzer provides a repeatable method to precisely measure the amount of force required to break the cracker and make sure that it falls within established limits to pass.

These two instances show how Food Quality Labs are making the investment in 21st Century technology. The amazing fact is that these test instruments cost so little compared to the human labor that has been used up to this point to verify food product quality. Given the competition in the market to retain customers, ensuring consistent quality is Objective #1. Make sure that viscosity and texture are two of the parameters that you have under control.