

The Effect of Particle Size on the Manufacture of Chocolate Products



The taste and texture of chocolate candies and cakes depend to a great extent on the particle size of the ingredients used to make them. Chocolate manufacturers characterize their products by what they describe as “mouth feel.” If the product is too coarse, the taste testers describe the product as tasting “gritty.” If the product is made too fine, the end product may be described as “sticky.”

Particle size analysis can place numerical parameters on these descriptions and use it to guide the chocolate producers in their efforts to make the best consumer-acceptable product.

In this study, we purchased three different commercially available chocolate products to see what sort of variations

in particle size might occur. The three products tested were of increasingly more expensive offerings from a typical “chocolate candy bar” to a block of “higher grade” chocolate.

The chocolate was extracted with ethanol and then analyzed with a Saturn DigiSizer® 5200. Figure 1 shows the results of this analysis. The particle size distribution curve seen in this figure shows three distinct and separate size distributions. These samples were also involved in a “blind” taste test. The taste test results ranked the chocolate with the finest size distribution as having the best taste and “mouth feel.” The other two samples were ranked in the same order as the particle size distributions with the coarsest size distribution having the least appealing taste.

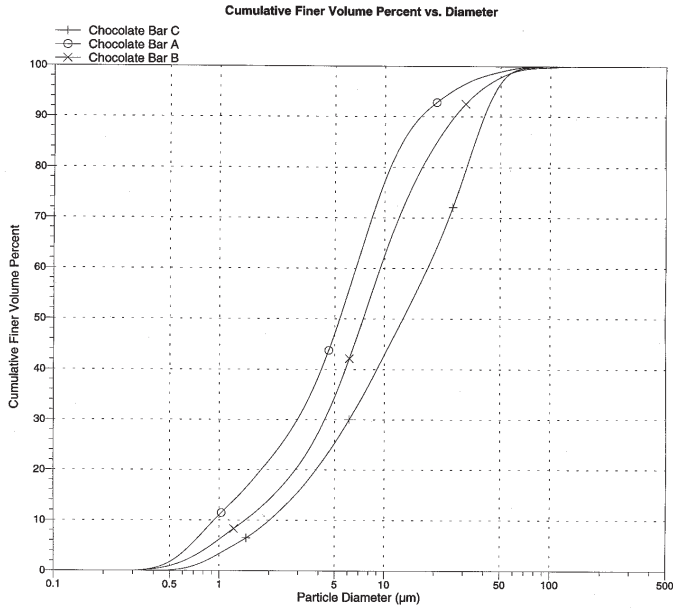


Figure 1. Three different chocolate types analyzed under the same conditions

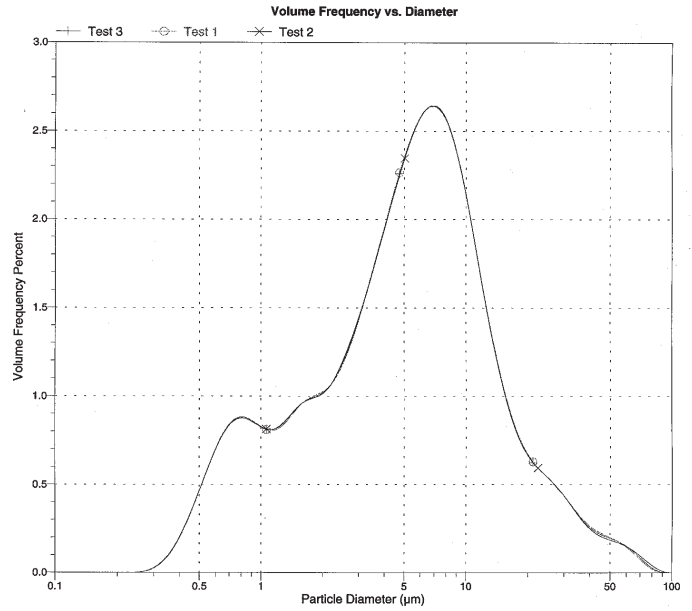


Figure 2. Three different tests of the same chocolate sample

Also of interest is the repeatability of the particle size analysis results. Figure 2 shows the results of three analyses of one of the chocolates. The results from these three analyses overlay each other so completely that it is hard to see that there are three different plots.

In conclusion, it has been shown that manufacturers of chocolate products may use particle size analysis to assist them in the production of the chocolate product they desire. This can be done with consistency and reliability from location to location when the particle size analysis is determined using the Saturn DigiSizer.