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Dimensions: 8.5 inch wide, 11 inch tall

Material: Paper, 92 Bright White or better, 75g/m² or heavier

Colors: Color Print on White

Printer: HP Color LaserJet 5550

Finish: None

Adhesive: None

Special Notes: Illustrations are Ref Only ** Not to Scale **

AQUA LAB UNIVERSITY Application Note

The AquaLab TrueDry CV9: Moisture Content Analysis Meets Good Science

by Brady Carter

Moisture content is a measure of the quantity of water in a product reported on either a wet or dry basis. Moisture content provides valuable information about yield and purity, making it important from a financial standpoint. In addition, moisture content provides information about texture since increasing levels of moisture provide mobility and lower the glass transition temperature. In theory, moisture content determination is simply a comparison of the amount of water in a product to the mass of everything else in the product. While it is simple in theory, further investigation of moisture content demonstrates that for such a simple concept, it is an extremely complex process to actually obtain reliable results.

Moisture Content Measurement

When it comes to determining the amount of water in a product, there are many choices available. The AOAC lists 35 different methods for measuring moisture content. These are classified as either direct or indirect measurement methods. Direct moisture content methods either force water out of a sample at elevated temperatures and track the weight change or involve a chemical reaction with water and titration. The most common direct moisture methods include air-oven drying and Karl Fischer titration. Indirect methods try to predict the moisture content based on either testing under accelerated heat conditions or by correlating another measured property to the moisture content. These secondary methods require calibration to a primary or direct method. Examples of indirect measurement methods include: halogen or IR based moisture balances, NIR absorption, and dielectric capacitance. The advantage of direct methods is that they are a primary measurement typically with superior precision, but may have the disadvantage of being more labor intensive and having long analysis times. Indirect methods are typically much faster than direct methods, but are not primary measurements based on accepted standards and consequently can suffer in reliability. Due to the absence of a scientific definition of "dry", all moisture methods suffer from the lack of a moisture standard to allow the comparison of methods or determination of accuracy. Further, any loss-on-drying method is subject to the ambient conditions under which the measurement is made. The ideal moisture method would combine high throughput testing with a primary measurement method, eliminate variability due to changing ambient conditions, and provide a scientific standard for "dry."

AquaLab TrueDry CV-9

The AquaLab TrueDry CV9 utilizes a unique design combined with a sound scientific understanding of moisture loss to create the ideal loss-on-drying moisture analyzer. A turntable approach enables high sample throughput by analyzing up to 9 samples simultaneously using primary reference methods (Figure 1). The temperature of each sample is controlled individually using controlled contact drying and the weight loss of each sample is tracked over time. An easy to use test setup interface makes it simple to match any reference moisture method without the need to use extreme temperatures to predict the moisture content. Table 1 provides the average moisture content and Table 2 provides the precision of the TrueDry compared to a conventional oven and a moisture balance for multiple sample types. For the comparisons, 3 replicated moisture analyses were used in each of a conventional oven, moisture balance, and

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