

Document Title: Achieving Constant Weight in the TrueDry CV9		Part # and Rev. 18026	
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http://manuals.decagon.com/Application%20Notes/18026_Achieving%20Constant%20Weight%20in%20the%20TrueDry%20CV9-Print.pdf

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Special Notes: Pages are duplexed front to back

Illustration is Ref Only

****Not to scale ****

	Application Note
Achieving Constant Weight in the TrueDry CV9 By Dr. Brady Carter	
<p>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.</p> <p>When is the test done? Due to the absence of a scientific definition of "dry", all moisture methods suffer from an ambiguity in knowing when a test is complete. The Food Analysis Handbook recommends drying until weight stops changing (Bradley 2010). The instructions given to determine if weight has stopped changing are to take two weight readings 30 minutes apart and determine if they are within a specified limit of each other. An example of a 0.1-0.2 g weight change limit for a 5 gram sample is given, but no specific values are provided. Many standard methods from organizations such as AOAC, AMCC, ISO, ASTM, and SSA state to dry to constant weight, but typically do not specify a limit and instead provide an estimated test time. These recommended test times purposefully are set to be conservatively long to increase the likelihood that the sample has ceased releasing water when the test is ended. The main reason for choosing to list test times over drying to constant weight is that the process to determine if weight has stopped changing when using a conventional oven is tedious and time consuming to a point of rendering it unlikely</p>	<p>even by the most dedicated lab technician. The process requires removing the samples, cooling them in a desiccator for 30 minutes, weighing, and then placing back in the oven and repeating the process again to allow comparisons between the weight readings. The demand on a lab technician with multiple tasks is too great to be reasonable. The solution would be to automate the process of determining constant weight.</p> <p>The Solution: The 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 that can dry to constant weight. A turntable approach enables high sample throughput by analyzing up to 9 samples simultaneously using any loss-on-drying reference method. 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 loss-on-drying reference moisture method without the need to use extreme temperatures to predict the moisture content.</p> <p>With the TrueDry system, to dry to constant weight instead of to a recommended test time, the user simply sets a desired weight change limit, or trigger value, expressed as a percent change in weight vs. time. The more stringent or smaller the weight change limit, the longer the test time, but the more likely to have achieved constant weight. The TrueDry system will track the weight of each of the 9 samples individually and will make a comparison between each reading until the percent weight change falls below the trigger value. The instrument will continue testing until the rate of weight change for all samples has reached the trigger value, which will end the test. The only work required by personnel is to setup the test and load the</p>
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