



Designation: D8196 – 22

## Standard Practice for Determination of Water Activity ( $a_w$ ) in Cannabis Flower<sup>1</sup>

This standard is issued under the fixed designation D8196; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reappraisal. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reappraisal.

### INTRODUCTION

The concept of water activity is more than 50 years old. For many years, researchers tried to equate bacterial growth potential with water content. William Jones Scott showed in 1953 that microorganisms have a limiting  $a_w$  level for growth (1),<sup>2</sup> thus being the first to establish that bacterial growth correlated with water activity, not water content of organic materials. It is now generally accepted that  $a_w$  is more closely related to the microbial, chemical, and physical properties of foods and other natural products than is total moisture (2). It is firmly established that growth of specific microbes is inhibited at or below specific water activity values (3).

Total water content (moisture) measurements do not necessarily reflect water available for microbial growth and thus are an inaccurate means for controlling microbial growth, because the water content sufficient for microbial growth is dependent on the substance being tested. Water activity measurement is more accurate than total water content (moisture) measurement as it relates directly to the water available to microbes. Safe  $a_w$  levels are constant relative to particular microbes, regardless of the substance being tested.

### 1. Scope

1.1 This practice covers the recommended procedure for determining the water activity ( $a_w$ ) of a cannabis flower sample.

1.2 *Units*—The values stated in SI units are to be regarded as the standard. Water activity is a ratio, and thus is without unit designation.

1.3 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.4 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

### 2. Referenced Documents

2.1 *ASTM Standards:*<sup>3</sup>

**D8197 Specification for Maintaining Acceptable Water Activity ( $a_w$ ) Range (0.55 to 0.65) for Dry Cannabis Flower Intended for Human/Animal Use**

### 3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *cannabis flower, n*—the flowering or fruiting tops of the cannabis plant (excluding seeds and leaves when not accompanied by flowering or fruiting top) from which the resin has not been extracted. (adapted from the UN Single Convention on Narcotic Drugs, 1961<sup>4</sup>)

3.1.2 *cultivator container, n*—packaging used by cannabis grower/harvester to store and/or ship product in large quantities after drying.

3.1.3 *dispensary container, n*—packaging used by a cannabis-dispensing establishment to provide the cannabis flower consumer a satisfactory storage container.

3.1.4 *packager container, n*—packaging used by the packager to store and ship product to dispensing establishments.

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee D37 on Cannabis and is the direct responsibility of Subcommittee D37.04 on Processing and Handling.

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<sup>2</sup> The boldface numbers in parentheses refer to a list of references at the end of this standard.

<sup>3</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>4</sup> [www.unodc.org/pdf/convention\\_1961\\_en.pdf](http://www.unodc.org/pdf/convention_1961_en.pdf), p1, accessed 2018.01.23