



Designation: D8498 – 23

Standard Guide for Compliance to the Specifications of ASTM D8450¹

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INTRODUCTION

In the cannabis/hemp industry, fairness in the marketplace for cannabis/hemp products is desired. Thus, standards for assuring safety, quality, and weight stabilization during key steps of the cannabis/hemp flowers sojourn are in order. This guide is added to other ASTM standards to assure safety, quality, and weight stabilization of cannabis/hemp flower and will be used by purveyors who move the cured crop to packaging used for distribution to another licensed operator or the end user.

1. Scope

1.1 Specification **D8450** specifies the environmental conditions, such as temperature, humidity, and lighting under which the cured, dry, cannabis/hemp flowers in fresh format intended for human use are to be packaged to assure the safety, quality, and weight stabilization of the packaged flower. This guide suggests means by which the packager of cannabis/hemp can meet Specification **D8450**.

1.1.1 This guide does not apply to frozen cannabis/hemp.

1.1.2 This guide does not apply to cannabis/hemp intended for extraction.

1.2 This guide applies only to controlling an indoor environment (heat, cooling, humidity control, lighting) surrounding packaging operations. Outdoor operations are outside the scope of this guide and are not addressed.

1.3 This guide can be used by licensed operators in the cannabis/hemp space who move the cured crop(s) into consumer or non-consumer packaging used for distribution.

1.4 Security of the cannabis/hemp flower during the packaging process is not within the scope of this guide.

1.5 This guide is intended to remain valid until the packaged cannabis/hemp flower is placed in storage or transit.

1.6 Authorities having jurisdiction may have additional or alternate requirements which shall take precedence or supersede this guide.

1.7 *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*

appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.

1.8 *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:²

D8196 Practice for Determination of Water Activity (a_w) in Cannabis Flower

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

D8233 Guide for Packaging and Labeling of Consumer Resin Cannabis Products for Sale to Adult Consumers, Legally Authorized Medical Users, and Caregivers in a Business-to-Consumer Retail Environment (Retailers)

D8270 Terminology Relating to Cannabis

D8309 Guide for Stability Testing of Cannabis-Based Products

D8450 Specification for Environmental Conditions While Packaging Cannabis/Hemp Flower

3. Terminology

3.1 *Definitions*—General definitions are in accordance with Terminology **D8270**, unless otherwise indicated.

3.2 *Definitions of Terms Specific to This Standard:*

¹ This guide 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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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3.2.1 *environmental conditions, n*—the atmosphere immediately surrounding the cannabis/hemp flower as it is transferred from drying/curing to packaging, whether controlled within the immediate vicinity in which the flower is contained, or in the larger space surrounding the packaging operation of the flower.

3.2.2 *relative humidity, n*—the relative humidity (RH) of an air-water mixture is defined as the ratio of the partial pressure of water vapor (p_{H_2O}) in the mixture to the equilibrium vapor pressure of water ($p^*_{H_2O}$) over a flat surface of pure water at a given temperature.

$$RH = p_{H_2O} / p^*_{H_2O}$$

4. Significance and Use

4.1 Standards and practices for assuring safety, quality, and weight stabilization during key steps of the cannabis/hemp flowers sojourn are in order.

4.2 This guide is intended to assist in assuring safety, quality, and weight stabilization of cannabis/hemp flower during indoor packaging operations.

4.3 This guide is intended to assist in assuring that packaged cannabis/hemp flower has a water activity of 0.55 to 0.65 per Specification **D8197**.

4.4 This guide is intended to be used by purveyors who move the cured crop to consumer or non-consumer packaging used for distribution.

5. Monitoring Equipment

5.1 *Temperature*—Device or devices capable of measuring temperature to assure specifications of Specification **D8450** are met. Additionally, devices capable of measuring temperatures in a manner that advances systems optimization are suggested. Monitoring and tracking may be automated or manual.

5.2 *Relative Humidity*—A device or devices capable of measuring relative humidity to assure specifications of Specification **D8450** are met. Additionally, devices capable of measuring relative humidity in a manner that advances systems optimization are suggested. Monitoring and tracking may be automated or manual.

NOTE 1—Often equipment for monitoring both temperature and relative humidity are combined into a single apparatus or system. It is important to assure that both functions perform to meet specifications across the specification ranges.

6. General Considerations and Record Keeping

6.1 Packaging equipment and facilities (including HVAC equipment) should be designed and maintained to assure conditions not conducive to mold growth. Design and operation should include orderly placement of incoming cannabis/hemp flower and packaged cannabis/hemp flower to prevent cross contamination of the packaged cannabis/hemp flower. These areas should be clean, dry (meeting the standards of Specification **D8450**), have adequate air circulation, and be monitored/ validated periodically.

6.2 Equipment used for transport and handling should be clean and dry. The design and operation should also prevent or limit the accumulation of heat, steam, condensation, or dust.

6.2.1 As necessary, consider equipping the packaging area with close-fitting screens or filters, or both, to prevent the entry of dust, smoke, steam, odors, and contaminated air.

6.2.2 Equipment should be designed, constructed, and maintained in a manner that permits it to be kept clean and orderly, permits effective cleaning of all its surfaces, prevents the contamination of the packaged cannabis/hemp flower and prevents the introduction of extraneous substances.

6.2.3 Regular maintenance and sanitation should be performed within internal areas where cannabis is handled and packaged to avoid product safety or contamination of concern to human health.

6.2.4 Standard Operating Procedures (SOPs) should be accessible by employees and applicable contractors for key operational elements including: sanitation and inspection of the facility and equipment; employee hygiene; distribution, including transfer, and receipt of cured unpackaged cannabis/hemp, delivery of packaged of cannabis/hemp flower; managing product on hold or destined for destruction.

6.3 In accordance with Specification **D8450**, records shall be maintained to assure that the specifications of that standard are met. Records should also be kept of various systems design parameters and operating conditions used to meet the specifications or lead to necessary modifications to do so.

6.3.1 Distribution records should be maintained and may include: tracking personnel handling the product during packaging and subsequent distribution and records demonstrating adequate sanitation, maintenance, and environmental conditions of the packaging environment.

6.3.2 Record keeping can be automated or manual.

7. Control of Temperature

7.1 If the packaging facility is large, temperature mapping is recommended to assure that the temperature in the immediate area of the packaged cannabis/hemp flower is being properly controlled. Single point temperature monitoring is often inadequate for such assurance.

8. Control of Relative Humidity

8.1 The relative humidity surrounding the packaging operation for packaged cannabis/hemp flower should be controlled to 55 % to 65 % RH during packaging.

8.1.1 Careful selection of humidistats to control humidifying or dehumidifying devices is essential to maintain 60 % \pm 5 % relative humidity in the area.

8.1.2 Sufficient air movement/mixing/circulation is necessary to assure against cold or hot spots which could result in condensation which increase the risk of mold growth.

8.2 Optionally or in addition, the immediate environment of the packaged cannabis/hemp flower can be controlled within bulk or individually packaged cannabis/hemp flower(s) using appropriate humidity control devices.

8.3 Packaging materials which have high moisture barrier properties such as mylar which resist water vapor transmission can provide extended protection to the packaged cannabis/hemp flower once it is secured in the package under Specification **D8450** conditions and the cannabis/hemp flower has a