



Designation: D8334/D8334M – 20

Standard Practice for Sampling of Cannabis/Hemp Post-Harvest Batches for Laboratory Analyses¹

This standard is issued under the fixed designation D8334/D8334M; 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 reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 Cannabis harvested materials require sampling strategies throughout their life cycle, from cultivation to the end consumer. For purposes of this standard, the term cannabis is inclusive of all cannabis inflorescence, including hemp varieties. The qualitative and quantitative characteristics of cannabis/hemp for human or animal consumption has safety implications throughout the life cycle from cultivation to end consumer. This standard provides best practice procedures and protocols for sampling batches of harvested cannabis inflorescence. Cannabis/hemp materials often exhibit variability across different parts within the same plant or across different plants within the same cultivar, or both, (1, 2).² Thus, sampling strategies are required which yield a representative a sample across a harvest batch. Representative sampling is required to ensure that the qualitative and quantitative test results accurately reflect cannabinoid identification, potency, identification and concentration of terpenes, concentration of trace metals, microbiological activity, mycotoxins, and concentration of pesticides across the batch.

1.2 Where procedural aspects of this practice differ from local regulatory or jurisdictional requirements, the local regulatory or jurisdictional authority's directives shall take precedence.

1.3 *Units*—The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, to ensure conformance with the standard, each system shall be used independently of the other, and values from the two systems shall not be combined.

1.4 *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 This practice is under the jurisdiction of ASTM Committee D37 on Cannabis and is the direct responsibility of Subcommittee D37.03 on Laboratory.

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

1.5 *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*:³

D8270 Terminology Relating to Cannabis

3. Terminology

3.1 *Definitions*—For general terms related to cannabis, see Terminology D8270.

3.2 *Definitions of Terms Specific to This Standard*:

3.2.1 *aliquot, n*—a discrete quantity of a cannabis/hemp (raw material) inflorescence collected by laboratory personnel/certified/trained sample collectors that shall be combined into representative samples for purposes of testing.

3.2.2 *cannabis, n*—a genus of flowering plants within the Cannabaceae family identified by their distinctive glandular trichomes, divided serrated leaves, and tough bast fibers.

3.2.2.1 *Discussion*—In this standard, the term cannabis is used to mean cannabis raw material that includes resin cannabis, nutritional cannabis, and industrial cannabis, that includes hemp, in a harvested raw material form.

3.2.3 *composite sample, n*—a final mixture of all sample aliquots pulled within a specific harvest batch, homogenized, and labelled.

3.2.4 *harvest batch, n*—a specifically identified quantity of cannabis inflorescence, that is uniform in cultivar, harvested within a concurrent time frame, and, cultivated using the same pesticides and other agricultural chemicals.

3.2.5 *inflorescence, n*—a group or cluster of flowers arranged on a stem that is composed of a main branch or a

³ 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.

complicated arrangement of branches. Morphologically, it is the modified part of the shoot of seed plants where flowers are formed.

4. Summary of Practice

4.1 This standard provides best practice procedures and protocols for sampling cannabis harvest batches to collect representative samples used for laboratory testing that are representative of an entire harvest batch that is intended for human or animal consumption.

4.2 Harvest batch size for batches of inflorescence shall have a maximum weight of 6.8 kg [15 lb], unless local jurisdiction has alternative requirements for maximum batch size.

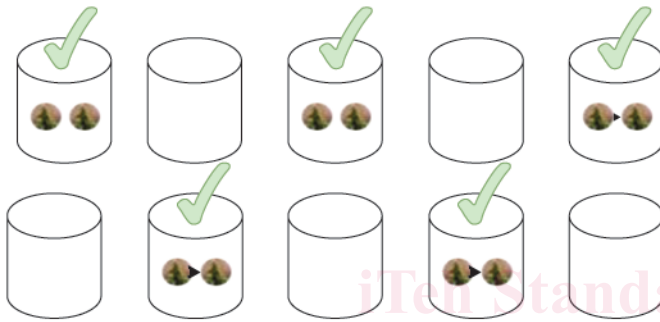
4.3 The sampling protocols in this standard:

4.3.1 Apply to harvest batches of cannabis grown indoor or outdoor;

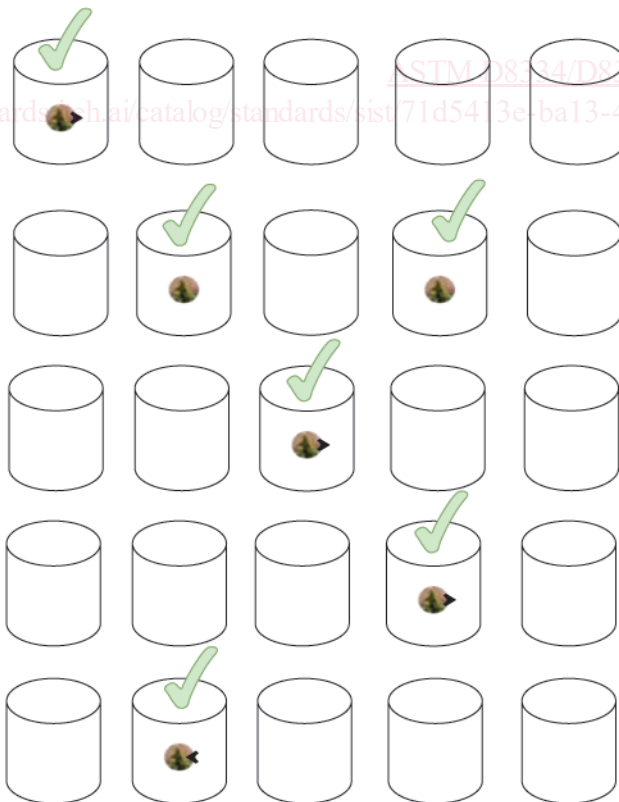
4.3.2 Attempt to minimize harvest lot variation;

4.3.3 Requires that all material in a harvest batch comes from the same cultivar;

Batch size - 5 kg [0.011 lb]
10 containers holding 0.5 kg [0.0011 lb] each



Batch size - 25 kg [55.1 lb]
10 containers holding 1.0 kg [2.2] each



Requires 3 × for collection:
1) Testing Sample
2) Retest Sample
3) Retain Sample

Repeat sampling from all containers until you meet this mass.

Assuming 20 g [0.044 lb] minimum for full panel test:
3 × 20 g [0.044 lb] = 60 g [0.132 lb] (Total weight collected)

Collect sample specimens at random from checked containers until you meet the minimum Lab recommended weight for testing.

Legend

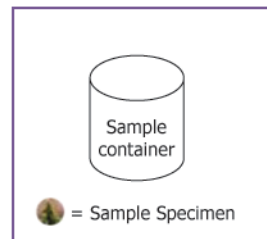


FIG. 1 Sample Processing Examples

4.3.4 Provides a protocol for collecting a representative sample of each harvest batch according to the appropriate schemes; (A or B) (Fig. 1 and Fig. 2); and

4.3.5 Create a composite sample with sufficient material to provide for a sample retain and to accommodate all required analyses, and retests if determined necessary by the laboratory.

5. Significance and Use

5.1 This standard will provide best practices for the sampling of harvested cannabis inflorescence with the intent to assure representative sampling.

5.2 The laboratory results and their respective harvest batch associations have implications and significance to regulatory requirements, quality control considerations throughout the product’s life cycle, and the safety of the consumers who may be adversely affected by consumption of product that was not tested in a homogeneous manner (3).

5.3 This standard does not address the appropriate sampling of processed cannabis materials such as such as extracts, seeds, edibles, topicals, etc.

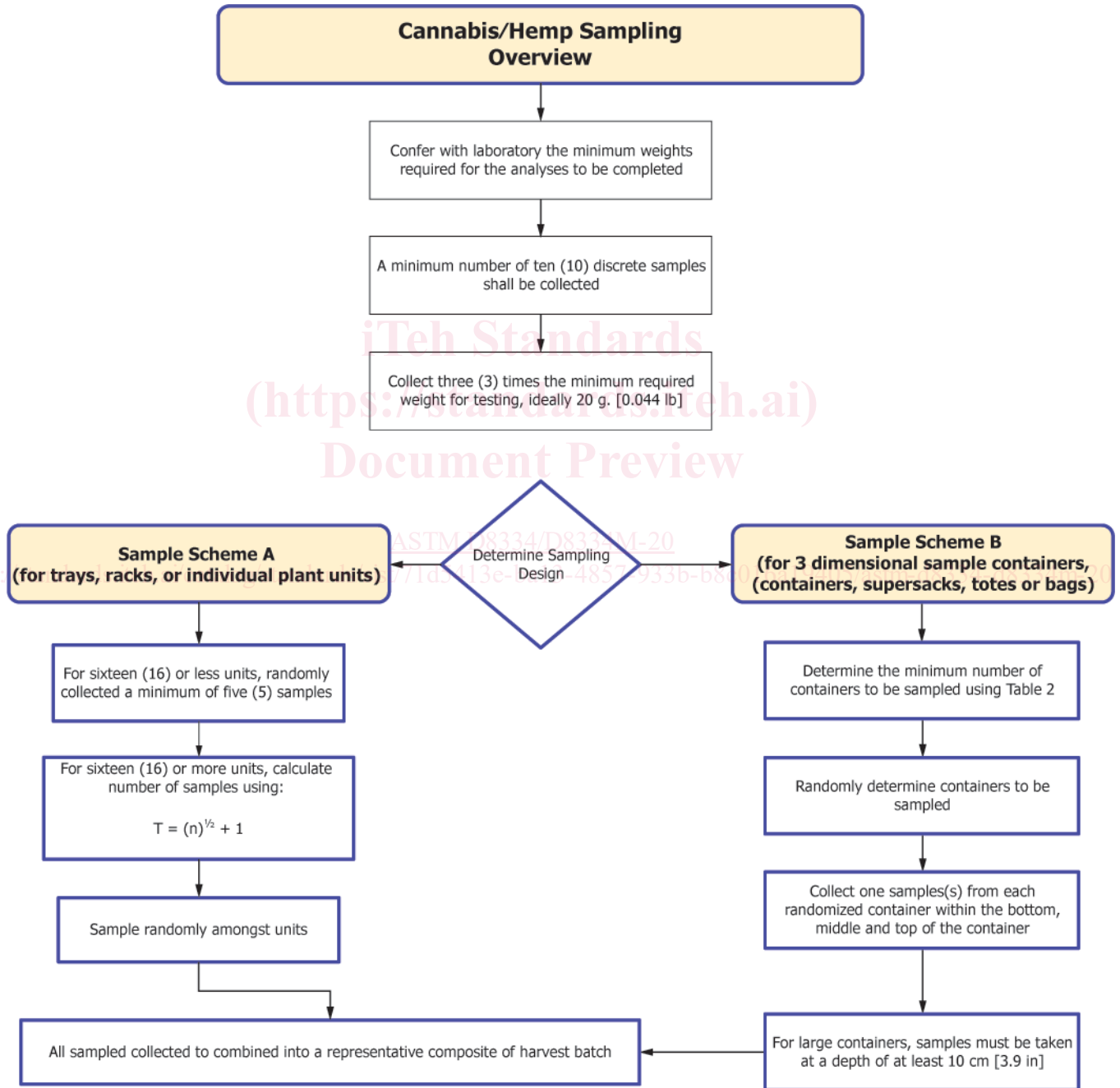


FIG. 2 Flow Chart of Sampling Procedure



5.4 This standard addresses the sampling of cannabis inflorescence destined for human or animal consumption.

5.5 This standard does not address pre-harvest field sampling or large untrimmed or unprocessed harvest batches.

6. General Sampling Considerations

6.1 Sampling protocols for sampling harvest batches of cannabis inflorescence, shall include:

6.1.1 All attempts to minimize inhomogeneity shall be practiced and documented.

6.1.2 All material within a defined harvest batch shall come from the same cultivar.

6.1.3 All material within a harvest batch will have documentation indicating the harvest batch was grown within consistent environmental parameters as defined by the cultivator's internal environmental parameter specifications including such elements as:

6.1.3.1 Light exposure (indoor cultivar);

6.1.3.2 Temperature (indoor cultivar);

6.1.3.3 Humidity (indoor cultivar);

6.1.3.4 Field dust and wind conditions (outdoor cultivar);

6.1.3.5 Determination of no adjacent grow area contamination drift (outdoor cultivar); and

6.1.3.6 Exposure to the same quantity and type of agricultural chemicals (indoor and outdoor cultivars).

6.1.3.7 Statement of over-spray drift of potential over adjacent crop boundaries and appropriate testing in pre-harvest potentially affected within overspray zones (outdoor cultivar).

6.2 *General Sampling and Homogeneity Checks:*

6.2.1 When sampling any harvest batch, the sample collector shall check for any signs of product heterogeneity (including the presence of seeds or field detritus).

6.2.2 If there are visual signs of spoilage or contamination, the harvest batch should be labelled as hazardous and discarded.

6.2.3 During area sampling, the sample collector shall conduct a preliminary assessment of the area to be sampled (if applicable), draw a sketch of area to be sampled, and note any indications of inhomogeneity within the sampling area as well as the global positioning coordinates of field area sampled (if applicable).

6.2.4 During sampling, the sample collector shall look for, and record on an appropriate sampling report, differences in the harvest batch being sampled, such as color, shape, size, and treatment.

6.3 *General Procedural Guidelines That Apply to All Sampling Include:*

6.3.1 Gaining access to the entire harvest batch (3);

6.3.2 Use of appropriate disinfected sampling equipment following aseptic sampling procedures;

6.3.3 Randomly and systematically taking sample specimens throughout the harvest batch as described in Section 7;

6.3.4 Obtaining a minimum number of sample specimens (as defined by the sampling plan);

6.3.5 Performing sampling within one continuous unit of time (or documenting controlled storage of harvest batch, if over multiple days); and

NOTE 1—In extraordinary situations, such as large harvest batches, sampling may need to span more than one day or multiple sample collectors, in which case justification shall be noted and the storage of the harvest batch subject to sampling and sample collector identification shall be controlled.

6.3.6 Record all observations and procedures used while collecting the sample specimens on the appropriate sampling report.

6.4 *Sampling Report:*

6.4.1 A sampling report completed by the sample collector for the sampling event shall be submitted along with appropriate chain-of-custody (COC) documents with the collected samples.

6.4.2 The report shall include, at a minimum, the following information:

6.4.2.1 Sample collector contact information and affiliation;

6.4.2.2 Harvest batch weight;

6.4.2.3 Composite sample weight;

6.4.2.4 Reference to sampling protocol utilized;

6.4.2.5 COC;

6.4.2.6 Identification of cultivar(s) sampled; and

6.4.2.7 Record overall characteristics during the preliminary visually assessment on the sampling report, including:

(1) Storage/presentation (trays, containers, etc.);

(2) Approximate percentage of foreign material present, if any; and

(3) Any other physical or visual characteristics;

(4) Sampling locations collected;

(5) Name of laboratory (third-party or internal) performing the analyses;

(6) Any additional harvest batch information as denoted within this standard; and

(7) Documentation of the total number of storage containers that exist for a harvest batch and the number of containers utilized for sampling.

6.5 *Aseptic Sampling Equipment to be Used in the Sampling Process May Include:*

6.5.1 Tongs;

6.5.2 A permanent marker or indelible ink pen;

6.5.3 Corers;

6.5.4 Scissors, pliers, garden shears, razor blades, or equivalent;

6.5.5 Global positioning system (GPS) for location reporting (if applicable);

6.5.6 Composite sample carrying bag or container (free of contaminants);

6.5.7 Labels or tags;

6.5.8 Wipes;

6.5.9 Field balance (capable of weighing $\pm 5\%$ of specimen weight or 0.1 g [0.000220462 lb], whichever is less) that is calibrated to include the range of specimen weight.

NOTE 2—Official weight will be verified upon receipt at analytical laboratory, thus, a full NIST calibration scheme or equivalent is not required for this step.

6.5.10 *Cleaning Solutions*—Ethanol, minimum 70 % or equivalent.

6.5.11 Gloves (to be aseptically cleaned after donning).