



Standard Practice for Measuring the Physical Properties of Cannabis/Hemp Pre-rolls¹

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1. Scope

1.1 This practice is intended to be used to identify the physical properties of a cannabis/hemp pre-roll.

1.2 This practice shall apply to pre-rolls made using herbal material(s) from any type of a cannabis plant (that is, cannabis/hemp), regardless of the cannabinoid content. For the sake of brevity, the term “cannabis” shall be used henceforth to refer to any type of cannabis plant (cannabis/hemp).

1.3 This practice helps to provide clarity on pre-roll preparation and sampling to identify, measure, and report the length, diameter, and weight of cannabis pre-rolls.

1.4 This practice shall not be applicable to infused cannabis pre-rolls, which are outside the scope of this standard.

1.5 *Units*—The values stated in either SI units or United States Customary Units (USC Units) are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard. Metric units will be stated as standard and USC units will be shown in brackets relative to the metric units.

1.6 *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.*

1.7 *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. Terminology

2.1 Definitions of Terms Specific to This Standard:

¹ 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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2.1.1 *cannabis end diameter, n*—a straight line segment that passes through the center of the cannabis herbal material side of the pre-roll circumference at the widest location. (See Fig. 1.)

2.1.2 *crutch, n*—a small strip of thick paper of which one end is folded over alternating the fold direction to form a “W” then rolled into a cylinder.

2.1.2.1 *Discussion*—The terms “tip,” “filter tip,” and “filter” are synonymous with “crutch.”

2.1.3 *diameter measuring device, n*—an analogue or electronic device used to measure the diameter of an object capable of measuring within 0.1 mm [0.0039 in.] or less.

2.1.3.1 *Discussion*—Examples of such devices include, but are not limited, to calipers, verniers, and digital micrometers.

2.1.4 *filter tip diameter, n*—a straight line segment that passes through the center of the filter side of the pre-roll circumference. (See Fig. 1.)

2.1.5 *length (L), n*—the measurement from one end of the pre-roll to the other along the longest side. (See Fig. 1.)

2.1.6 *length measuring device, n*—an analogue or electronic device used to measure the length of an object, capable of measuring within 0.1 mm [0.0039 in.] or less.

2.1.6.1 *Discussion*—The term measuring device is commonly known as an instrument for measuring physical quantity or characteristics and has varying degrees of instrument error and measurement uncertainty. Examples of such devices can be vernier, dial, and digital calipers.

2.1.7 *pre-roll, n*—a prefabricated unit for personal inhalation via combustion that is typically constructed of a wrapping paper, a filter, and dried flowers of a cannabis plant.

2.1.7.1 *Discussion*—A common synonym for pre-roll is joint.

2.1.8 *relative humidity (RH) measuring device, n*—a device with a humidity sensor or detector used to measure the relative humidity in the air capable of measuring within ± 5 %.

2.1.9 *temperature measuring device, n*—a device used to measure temperature capable of measuring within ± 1 °C [± 1.8 °F].

2.1.10 *tipping paper, n*—a binding paper material used to marry the filter and wrapping paper of a pre-roll.

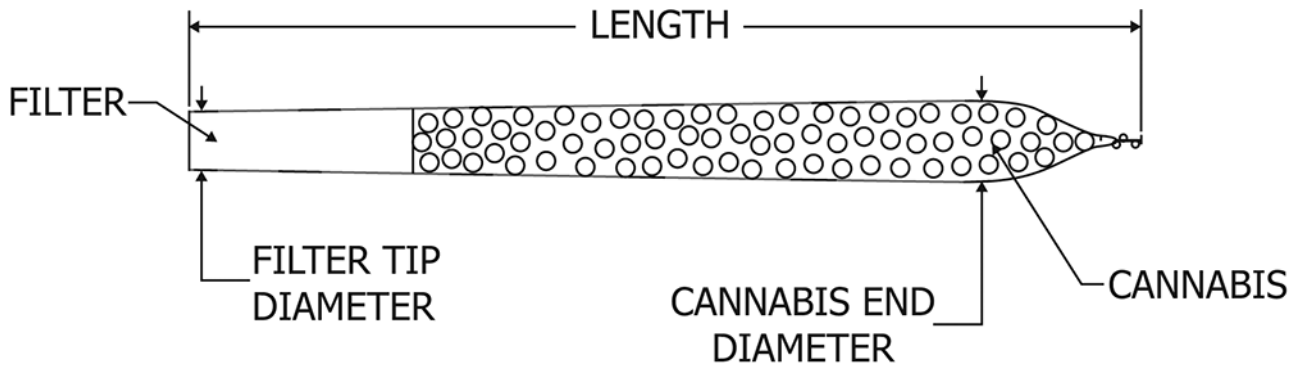


FIG. 1 Schematics of a Pre-roll Showing the Length, Filter Tip, and Cannabis End Diameter

2.1.11 *weighing scale, n*—a calibrated analytical balance or top loading balance used to measure the mass of an object capable of weighing $\pm 5\%$ of specimen weight or 0.1 g [0.0035 oz], whichever is less.

2.1.12 *weight (W), n*—the amount of the cannabis herbal material in the pre-roll. (See Fig. 1.)

2.1.13 *wrapping paper, n*—a paper that binds together the milled cannabis herbal material in a pre-roll.

3. Summary of Practice

3.1 This document outlines a practice for preparation, sampling, and measuring the physical properties of a pre-roll, including length, diameter, and weight. Length is measured by using a length measuring device from filter tip end to cannabis end tip of a pre-roll. The filter tip and cannabis end diameter are measured by using a diameter measuring instrument. Weight of the cannabis herbal material is measured by using an analytical balance. A sample size of thirty units is used, and thirty measurements are performed for each physical property, namely length, diameter, and weight. The measurements are used to determine the average physical properties of pre-rolls. Sample sizes can be defined on a case-by-case basis and should be statistically representative of production batches when using this practice for analyzing pre-rolls meant for sale.

4. Significance and Use

4.1 This practice will specify the baseline physical properties of a pre-roll, including the weight of cannabis herbal material in the pre-roll, the length of the pre-roll, and the diameter of the pre-roll.

4.2 This practice will provide clarity on the physical properties of cannabis pre-rolls.

5. Apparatus

5.1 Length measuring device, diameter measuring device, and weighing scale.

6. Hazards

6.1 Personnel shall take all necessary safety precautions when handling cannabis herbal material and pre-rolls.

7. Preparation of Apparatus

7.1 Clean and, if necessary, calibrate the length and diameter measuring devices in accordance with manufacturer in-

structions before performing dimensional tests and document the calibration process.

7.2 Clean and, if necessary, calibrate the weighing scale in accordance with manufacturer instructions before performing weight tests and document the calibration process.

8. Conditioning

8.1 Store all pre-rolls in a cool, clean, and safe place before and after use. Storage and testing room environment temperatures should be maintained at $23\text{ }^{\circ}\text{C} \pm 3\text{ }^{\circ}\text{C}$ [$73.4\text{ }^{\circ}\text{F} \pm 5.4\text{ }^{\circ}\text{F}$] and $55 \pm 10\%$ relative humidity. Additionally, pre-rolls should be stored as in accordance with the jurisdiction having oversight for the storage of cannabis. If the recommended temperature and humidity guidelines conflict with local regulations, local regulations shall be used, and prevail. The temperature and relative humidity within the testing environment shall be recorded during testing and documented on the final report.

9. Procedure

9.1 Measuring the Length of the Pre-roll:

9.1.1 If applicable, turn on the length measuring device and follow the procedure outlined in Section 7, Preparation of Apparatus.

9.1.2 Place the pre-roll on a flat, clean surface.

9.1.3 Measure the length of the pre-roll in millimetres [inches], from the beginning of the pre-roll to the end of the pre-roll as depicted in Fig. 1.

9.1.4 Record the measurement result to the nearest 0.1 mm [0.0039 in.] on the data entry field as shown in Table A1.1.

9.2 Measuring the Diameter of a Pre-roll:

9.2.1 If applicable, turn on the diameter measuring device and follow the procedure outlined in Section 7, Preparation of Apparatus.

9.2.2 Measure the filter tip diameter and cannabis end diameter of the pre-roll in millimetres [inches], as depicted in Fig. 1.

9.2.3 Record each measurement result to 0.1 mm [0.0039 in.] on the data entry field as shown in Table A1.1.

9.3 Measuring the Weight of Cannabis in the Pre-roll:

9.3.1 Place the weighing scale on a flat, clean surface.

9.3.2 Clean the weighing scale prior to use.

9.3.3 Turn on the weighing scale and follow the procedure outlined in Section 7, Preparation of Apparatus.

9.3.4 Place an empty pre-roll without cannabis on the weighing scale and tare.

9.3.5 Remove the empty pre-roll and replace with a pre-roll filled with cannabis herbal material.

9.3.6 Record the measurement result to 0.1 g [0.0035 oz] on the data entry field as shown in **Table A1.1**.

10. Report

10.1 Calculations:

10.1.1 Calculate the average of the thirty recorded lengths, filter tip diameters, and cannabis end diameters. Record the averages to the nearest 0.1 mm [0.0039 in.] in the respective data entry fields as shown in **Table A1.1**.

10.1.2 Calculate the average of the thirty recorded weights, and record the average to the nearest 0.1 g [0.0035 oz] on the data entry field as shown in **Table A1.1**.

10.1.3 Calculate the standard deviation and relative standard deviation for each of the lengths, diameters, and weights, and record in the respective entry field as shown in **Table A1.1**.

10.2 Summary of Physical Properties of a Pre-roll:

10.2.1 Length:

10.2.1.1 Record the average length of the pre-roll to the nearest 0.1 mm [0.0039 in.] in **Table A1.2**.

10.2.2 Diameter:

10.2.2.1 Record the average filter tip and cannabis end diameters of the pre-roll to the nearest 0.1 mm [0.0039 in.] in **Table A1.2**.

10.2.3 Weight:

10.2.3.1 Record the average weight of the pre-roll to the nearest 0.1 g [0.0035 oz] in **Table A1.2**.

11. Keywords

11.1 cannabis; crutch; diameter; diameter measuring device; filter paper; hemp; industrial hemp; length; length measuring device; physical; pre-roll; properties; rolling paper; scale; weight

ANNEX

(Mandatory Information)

A1. REPORT TABLES

A1.1 See **Table A1.1** and **Table A1.2**.

TABLE A1.1 Template for Recording Pre-roll Characteristics

Physical Properties of a Pre-roll

| Physical Properties of a Pre-roll | | | | | |
|--------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------|-----------------------------------------------------------|-------------------------------------------------------------|
| Weighing Scale Model No. / Serial No. / Unique Identifier #: | ASTM D8343/D8343M-21 | | | | |
| Length/Diameter Measuring Device Model No. / Serial No. / Unique Identifier #: | | | | | |
| Temperature °C [°F] | | | | | |
| Relative Humidity (%) | | | | | |
| | Sample # | Weight of Cannabis/ Hemp in Pre-roll 0.1 g [0.0035 oz] | Length of Pre-roll 0.1 mm [0.0039 in.] | Filter Tip Diameter of Pre-roll 0.1 mm [0.0039 in.] | Cannabis End Diameter of Pre-roll 0.1 mm [0.0039 in.] |
| Sample Size (<i>n</i>) | | | | | |
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| | Average = | | | | |
| | Standard Deviation = | | | | |
| | Relative Standard Deviation = | | | | |