The New Jersey Cannabis Regulatory Commission's Testing Guidance

Revision 1.0

September 28, 2022

The New Jersey Cannabis Regulatory Commission (Commission) has provided this guidance to define contaminants and corresponding action limits associated with those contaminants in cannabis and cannabis products. This information is intended for testing laboratories licensed by the Commission.

Sampling

The testing laboratory shall collect samples of cannabis and cannabis product in accordance with N.J.A.C. 17:30-16.3 and this Testing Guidance.

(a) Upon request of a cannabis business when a batch or lot is ready for testing, a testing laboratory employee shall initiate a sample collection for all applicable tests before packaging:

1. After usable cannabis is in its final usable form, including placement of usable cannabis in a pre-roll, ready to be manufactured into a cannabis product, or ready to be distributed for personal use; or

2. After a cannabis product is in its final processed form, including placement of vaporized formulation in its electronic smoking device or oil in its pressurized metered dose inhaler, or ready to be distributed for personal use.

(b) A testing laboratory employee shall collect a representative initial sample and a representative retention sample from each batch of usable cannabis from a cannabis business that cultivates and from each lot of cannabis products from a cannabis business that manufactures according to a statistically valid sampling method.

1. A cannabis business employee shall be physically present to observe the testing laboratory employee collect any sample.

2. The cannabis business employee shall not touch the usable cannabis, cannabis product, or the sampling equipment while the testing laboratory employee is collecting the samples.

3. The testing laboratory employee shall collect a representative initial sample and a representative retention sample of each batch or lot by removing increment samples of material or units from throughout the container(s) in the batch or lot in the manner required at (b)3i and ii below.

   i. Where appropriate for the purpose of the sample and the nature of the material being sampled, sample portions are removed from the top, middle, and bottom of containers**,** with the top sample being taken from a depth of not less than 10 centimeters.

   ii. Containers from which samples have been taken shall be marked to indicate that samples have been removed from them.

4. A representative initial sample of usable cannabis shall be .5 percent of a batch or lot, with the following increment sample amounts:

   i. ≤ 10 lbs. of usable cannabis, five increment samples;

   ii. 10.1-20 lbs. of usable cannabis, 10 increment samples;

   iii. 20.1-30 lbs. of usable cannabis, 15 increment samples;

   iv. 30.1-40 lbs. pounds of usable cannabis, 20 increment samples; and

   v. 40.1-50 lbs. pounds of usable cannabis, 25 increment samples.

vi. 50.1-100 pounds of usable cannabis, 30 increment samples.

5. A representative initial sample of non-homogenizable cannabis product shall be:

i. ≤ 50 total units, two increment units;

ii. 51-150 total units, three increment units;

iii. 151-500 total units, five increment units;

iv. 501-1,200 total units, eight increment units;

v. 1,201-3,200 total units, 16 increment units; and

vi. 3,201-10,000 total units, 40 increment units;

vii. 10,001-35,000 total units, 125 increment units.

6. A representative retention sample shall be two times the amounts listed for representative initial samples of a batch or lot at (b)4 and 5 above.

7. When collecting representative samples, the testing laboratory employee shall:

i. Clean, open, sample, and reseal the containers in a manner designed to prevent introduction of contaminants; and

ii. Use sterile equipment and work surfaces, personal protective equipment, and aseptic sampling techniques.

(c) After completing sample collection, the testing laboratory employee shall place the cannabis business license number and affix a label with a description and the quantity of the content on each sample container.

(d) The testing laboratory employee shall seal each sample container.

(e) The cannabis business employee and the testing laboratory employee shall initial each sample container.

(f) The testing laboratory employee shall provide a receipt for the collected samples to the cannabis business employee.

(g) The cannabis business employee shall record the samples removed from a batch or lot in the inventory record for the batch or lot.

(h) The testing laboratory employee shall transfer the representative retention samples to the cannabis business employee, who shall store them pursuant to N.J.A.C. 17:30-16.5.

(i) The testing laboratory employee shall securely transport any usable cannabis and cannabis product representative initial samples and at the testing laboratory, a testing laboratory employee shall record the receipt of the samples, in accordance with N.J.A.C. 17:30-16.3.

Testing

The testing laboratory shall test the initial samples of cannabis and cannabis product according to the standard operating procedures of the laboratory that have been approved by the accreditation body pursuant to N.J.A.C. 17:30-15.5(e) to confirm whether the samples meet the specifications of N.J.A.C.17:30-16.4 and this Testing Guidance.

The testing laboratory shall analyze the samples according to this Testing Guidance; Except when otherwise required by N.J.A.C. 17:30-16.1, *et seq*. and this Testing Guidance, the testing laboratory

shall analyze the samples according to the most current version of the cannabis inflorescence monograph published by the American Herbal Pharmacopeia (AHP).

(a) The testing laboratory shall do a visual inspection of usable cannabis and cannabis products to screen for the presence of foreign material.

1. The inspection shall include, at minimum:

    i. for usable cannabis, the interior and exterior of the dried flower; and

    ii. for a cannabis product, the exterior of the product

2. If visible foreign material such as sand, soil, cinders, dirt, mold or mildew exceeds 25% of the total sample area, the sample shall not meet specifications.

3. If visible foreign material exceeds 1 insect fragment, 1 hair or 1 count of mammalian excreta per 3.0g, the sample shall not meet specifications.

(b) After the foreign material screening, the testing laboratory shall homogenize all increment samples of the representative sample, except where the increment samples are separate cannabis product units and cannot be homogenized.

(c) Before testing for cannabinoid and terpene potency, the testing laboratory shall test usable cannabis for water activity in available water (aw).

1. To meet specifications, the sample shall not exceed 0.65 aw.

2. Except that the testing laboratory is not required to perform this test on usable cannabis that will be manufactured by an ATC into a cannabis product.

3. The testing laboratory shall use the Standard Practice for Determination of Water Activity in Cannabis Flower: ASTM D8196 sample analysis method.

(d) The testing laboratory shall test usable cannabis, cannabis concentrates, and cannabis-infused products to determine the chemical composition and potency of individual cannabinoids, both as a percentage and in mg/g (by weight), or in mg/mL (by volume).

1. The test shall include:

    i. delta-9-Tetrahydrocannabinolic Acid (THCA);

    ii. delta-9-Tetrahydrocannabinol (THC);

    iii. Cannabidiolic Acid (CBDA);

    iv. Cannabidiol (CBD);

    v. Cannabigerolic Acid (CBGA);

    vi. Cannabigerol (CBG); and

    vii. Cannabinol (CBN)

2. The test may include other cannabinoids, such as:

i. delta-8-Tetrahydrocannabinol (d8-THC);

ii. delta-9-Tetrahydrocannabivarinic acid (THCVA);

iii. delta-9-Tetrahydrocannabivarin (THCV);

iv. Cannabidivarinic Acid (CBDVA);

v. Cannabidivarin (CBDV);

vi. Cannabichromenic Acid (CBCA); or

viii. Cannabichromene (CBC);

3. The chemical composition and potency of individual cannabinoids for usable cannabis shall be calculated using a dry weight basis where:

$$\text{Dry weight \%} = \frac{\text{measured cannabinoid weight \%}}{1 - (\text{\% of moisture content after sample homogenization}/100)};$$

4. Except that the testing laboratory is not required to perform this test on usable cannabis that will be manufactured by an ATC into a cannabis product.

5. The testing laboratory shall use the Quantitation of Cannabinoids in Cannabis Dried Plant Materials, Concentrates, and Oils AOAC 2018.11 sample analysis method.

6. The testing laboratory shall validate its method using the AOAC SMPR 2017.002 validation for usable cannabis and the AOAC SMPR 2017.001 validation for cannabis concentrates and cannabis-infused products.

(e) The testing laboratory shall test usable cannabis and cannabis concentrates, and cannabis-infused products to determine the chemical composition and potency of the individual terpenes, separated by isomer, described in the most current version of the cannabis inflorescence monograph published by the American Herbal Pharmacopeia (AHP), both as a percentage and in mg/g (by weight) or in mg/mL (by volume).

1. The test may include the following terpenes:

i. alpha-Pinene;

ii. beta-Caryophyllene;

iii. beta-Myrcene;

iv. d-Limonene;

v. Ocimene;

vi. Terpinolene;

vii. alpha-Humulene;

viii. beta-Pinene; or

ix. Linalool;

2. For cannabis concentrate intended for inhalation or vaporized formulation, to meet specifications, the sample shall not exceed a level of terpenes that is 10% of the product.

3. Except that the testing laboratory is not required to perform this test on usable cannabis that will be manufactured by an ATC into a cannabis product.

4. The testing laboratory shall use any sample analysis method certified by the AOAC or validated by the FDA, the USP, or the most current version of the cannabis inflorescence monograph published by the American Herbal Pharmacopeia.

(f) The testing laboratory shall test vaporized formulation for additives, cutting agents, and artificial flavorings known to be harmful in parts per million (ppm).

1. To meet specifications, the sample shall not exceed the following levels:

i. Polyethylene glycol (PEG)	40 ppm
ii. Propylene glycol (PG)	8 ppm
iii. Vegetable glycerin or glycerol (VG)	1000 ppm
iv. Vitamin E acetate or tocopherol acetate (VEA)	1 ppm
v. Acetic acid (AA)	5000 ppm.

2. The testing laboratory shall use an AOAC-certified or FDA- or USP-validated sample analysis method for these contaminants.

(g) The testing laboratory shall test usable cannabis, cannabis concentrates, and cannabis-infused products for microbial contamination in Colony Forming Units (CFU)/g.

1. To meet specifications, the cannabis item sample shall not exceed the following levels:

i. Total aerobic bacteria count for usable cannabis	100,000 CFU/g
ii. Total aerobic bacteria count for cannabis products	10,000 CFU/g
iii. Total yeast and mold count for usable cannabis	100,000 CFU/g
iv. Total yeast and mold count for cannabis products	10,000 CFU/g
v. Pathogenic E. coli (including Shiga Toxin producing E. coli)	None detected
vi. Salmonella spp.	None detected
vii. Pathogenic Aspergillus (A. flavus, A. fumigatus, A. niger, A. terreus)	None detected

2. To meet specifications, the ingestible cannabis-infused product sample shall additionally not exceed the following levels:

i. Total coliforms 10 CFU/g

ii. Listeria monocytogenes None detected

3. The testing laboratory shall use the Yeast and Mold Counts in Foods and Dried Cannabis Flower: AOAC 997.02 sample analysis method for total yeast and mold count.

4. The testing laboratory shall validate its total yeast and mold count method using Viable Yeast and Mold Count Enumeration in Cannabis and Cannabis Products: AOAC 2021:009 validation.

5. The testing laboratory shall use an AOAC-certified or FDA- or USP-validated plating sample analysis method for total aerobic bacteria count and total coliforms.

6. The testing laboratory shall use (i) an AOAC-certified or FDA- or USP-validated agar plating sample analysis method or (ii) another AOAC-certified or FDA- or USP-validated pathogenic testing sample analysis method and agar plating of pathogens for pathogenic E. coli, Salmonella spp., pathogenic Aspergillus, and Listeria monocytogenes.

7. The testing laboratory shall validate its Salmonella spp. and Shiga Toxin producing E. coli methods using Detection of Salmonella species in Cannabis and Cannabis Products: AOAC 2020.002 and Detection of Shiga Toxin-Producing Escherichia coli in Cannabis and Cannabis Products: AOAC 2020.012.

8. The testing laboratory shall use the following methods for confirmation testing for Salmonella spp. and Shiga Toxin producing E. coli:

i. iQ-Check Salmonella II Real-Time PCR

ii. GENE-UP Salmonella 2 (SLM2)

iii. GENE-UP® EHEC Series (STEC)

iv. BAX System Real-Time PCR Assay Suite for STEC

v. iQ-Check STEC VirX/SerO/SerOII

vi. PathoSEEK Salmonella and STEC E. coli Multiplex Assay with SenSATIVAx Extraction

(h) The testing laboratory shall test usable cannabis, cannabis concentrate, and cannabis-infused products for mycotoxin contamination in parts per billion (ppb).

1. To meet specifications, the sample shall not exceed the following levels:

i. Alfatoxin B1 20 ppb

ii. Alfatoxin B2 20 ppb

iii. Alfatoxin G1 20 ppb

iv. Alfatoxin G2 20 ppb

v. Ochratoxin A 20 ppb

vi. Total cumulative mycotoxins 20 ppb.

2. The testing laboratory shall use an AOAC-certified or FDA- or USP-validated sample analysis method for mycotoxins.

3. The testing laboratory shall validate its mycotoxin method using Mycotoxin Screening Technique in Cannabis Plant Material and Cannabis Derivatives: AOAC 2020.013 validation.

(i) **Reserved**

(j) The testing laboratory shall test usable cannabis, cannabis concentrates, and cannabis-infused products for pesticides, fungicides, and plant growth regulators.

1. To meet specifications, the sample shall not exceed the following levels:

i.	Abamectin	0.5 ppm
ii.	Acetamiprid	0.2 ppm
iii.	Aldicarb	0.4 ppm
iv.	Azoxystrobin	0.2 ppm
v.	Bifenazate	0.2 ppm
vi.	Bifethrin	0.2 ppm
vii.	Boscalid	0.4 ppm
viii.	Carbaryl	0.5 ppm
ix.	Carbofuran	0.2 ppm
x.	Chlorantranilprole	0.2 ppm
xi.	Chlorpyrifos	0.2 ppm
xii.	Clofentezine	0.2 ppm
xiii.	Cyfluthrin	1.0 ppm
xiv.	Daminozide (Alar)	1.0 ppm
xv.	Diazinon	0.2 ppm
xvi.	Dichlorvos (DDVP)	0.1 ppm
xvii.	Dimethoate	0.2 ppm
xviii.	Etoxazole	0.2 ppm
xix.	Fenpyroximate	0.4 ppm
xx.	Fipronil	0.4 ppm

xxi.	Flonicamid	1.0 ppm
xxii.	Fludioxonil	0.4 ppm
xxiii.	Hexythiazox	1.0 ppm
xxiv.	Imazalil	0.2 ppm
xxv.	Imidacloprid	0.4 ppm
xxvi.	Kresoxim-methyl	0.4 ppm
xxvii.	Malathion	0.2 ppm
xxviii.	Metalaxyl	0.2 ppm
xxix.	Methiocarb	0.2 ppm
xxx.	Methomyl	0.4 ppm
xxxi.	Myclobutanil	0.2 ppm
xxxii.	Naled	0.5 ppm
xxxiii.	Oxamyl	1.0 ppm
xxxiv.	Paclobutrazol	0.4 ppm
xxxv.	Permethrin	0.5 ppm
xxxvi.	Phosmet	0.2 ppm
xxxvii.	Piperonyl butoxide	3.0 ppm
xxxviii.	Propiconazole	0.4 ppm
xxxix.	Pyrethrins	1.0 ppm
xl.	Spinosad	0.2 ppm
xli.	Spiromesifen	0.2 ppm
xlii.	Spirotetramat	0.2 ppm
xliii.	Thiacloprid	0.2 ppm
xliv.	Thiamethoxam	0.2 ppm
xlv.	Trifloxystrobin	0.2 ppm

2. The testing laboratory shall use an AOAC-certified or FDA- or USP-validated sample analysis method for pesticides.

3. The testing laboratory shall validate its pesticide method using Identification and Quantification of Selected Pesticide Residue in Dried Cannabis Flower: AOAC SMPR 2018.011 validation.

(k) The testing laboratory shall test cannabis concentrates and cannabis-infused products for residual solvents and other manufacturing residue.

1. To meet specifications, the sample shall not exceed the following levels:

i.	Acetone for inhalable products	750 ppm
ii.	Acetone for ingestible and dermal products	5000 ppm
iii.	Acetonitrile for inhalable products	60 ppm
iv.	Acetonitrile for ingestible and dermal products	410 ppm
v.	Benzene for inhalable products	1 ppm
vi.	Benzene for ingestible and dermal products	2 ppm
vii.	Butane for inhalable products	800 ppm
viii.	Butane for ingestible and dermal products	5000 ppm
ix.	Chloroform for inhalable products	2 ppm
x.	Chloroform for ingestible and dermal products	60 ppm
xi.	Ethanol for inhalable products	1000 ppm
xii.	Ethanol for ingestible and dermal products	5000 ppm
xiii.	Ethyl Acetate for inhalable products	400 ppm
xiv.	Ethyl Acetate for ingestible and dermal products	5000 ppm
xv.	Ethyl Ether for inhalable products	500 ppm
xvi.	Ethyl Ether for ingestible and dermal products	5000 ppm
xvii.	Ethylene Oxide for inhalable products	5 ppm
xviii.	Ethylene Oxide for ingestible and dermal products	50 ppm
xix.	Heptane for inhalable products	500 ppm
xx.	Heptane for ingestible and dermal products	5000 ppm
xxi.	Hexane for inhalable products	50 ppm
xxii.	Hexane for ingestible and dermal products	290 ppm
xxiii.	Isopropyl Alcohol for inhalable products	500 ppm

xxiv.	Isopropyl Alcohol for ingestible and dermal products	5000 ppm
xxv.	Methanol for inhalable products	250 ppm
xxvi.	Methanol for ingestible and dermal products	3000 ppm
xxvii.	Methylene Chlorate for inhalable products	125 ppm
xxviii.	Methylene Chlorate for ingestible and dermal products	600 ppm
xxix.	Pentane for inhalable products	750 ppm
xxx.	Pentane for ingestible and dermal products	5000 ppm
xxxi.	Propane for inhalable products	2100 ppm
xxxii.	Propane for ingestible and dermal products	5000 ppm
xxxiii.	Toluene for inhalable products	150 ppm
xxxiv.	Toluene for ingestible and dermal products	890 ppm
xxxv.	Trichloroethylene for inhalable products	25 ppm
xxxvi.	Trichloroethylene for ingestible and dermal products	80 ppm
xxxvii.	Xylenes (total of ortho-, meta-, para-) for inhalable products	150 ppm
xxxviii.	Xylenes (total of ortho-, meta-, para-)	2170 ppm
xxxix.	1,1 Dichloroethene for inhalable products	8 ppm
xl.	1,1 Dichloroethene for ingestible and dermal products	20 ppm
xli.	1,2 Dichloroethane for inhalable products	2 ppm
xlii.	1,2 Dichloroethane for ingestible and dermal products	5 ppm

2. Except that the ethanol limit in subparagraph xii of paragraph 1 does not apply to an ingestible product using alcohol as an ingredient or a topical formulation and the isopropyl alcohol limit in subparagraph xxiv of paragraph 1 does not apply to a topical formulation.

3. The testing laboratory shall use an AOAC-certified or FDA- or USP-validated sample analysis method for residual solvents.

4. The testing laboratory shall validate its residual solvents method using Identification and Quantitation of Selected Residual Solvents in Cannabis-Derived Materials: AOAC 2019.002 validation.

(k) The testing laboratory shall test usable cannabis, cannabis concentrates, and cannabis-infused products for heavy metals.

1. To meet specification, the sample shall not exceed the following levels:

i.	Arsenic for inhalable products	0.2 ppm
ii.	Arsenic for ingestible and dermal products	1.5 ppm
iii.	Barium	60.0 ppm
iv.	Cadmium for inhalable products	0.2 ppm
v.	Cadmium for ingestible and dermal products	0.5 ppm
vi.	Chromium for inhalable products	0.6 ppm
vii.	Chromium for ingestible and dermal products	1070 ppm
viii.	Lead for inhalable products	0.5 ppm
ix.	Lead for ingestible and dermal products	0.5 ppm
x.	Mercury for inhalable products	0.2 ppm
xi.	Mercury for ingestible and dermal products	2.0 ppm
xii.	Selenium	26.0 ppm
xiii.	Silver	1.4 ppm

2. The testing laboratory shall use the Heavy Metals in a Variety of Cannabis and Cannabis Derived Products: AOAC 2021.03 sample analysis method for heavy metals.

3. The testing laboratory shall validate its heavy metals method using Determination of Heavy Metals in a Variety of Cannabis and Cannabis Derived Products: AOAC SMPR 2020.001 validation.

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