# Office of Cannabis Management

## Required Testing of Each Lot of Adult Use Cannabis and Medical Cannabis Product

This document lists the permitted analytes and sets testing limits for contaminants as directed in 9 New York Codes, Rules and Regulations (NYCRR) Part 130 and Cannabis Law. Testing for each contaminant is required for all final adult- use and medical cannabis product types unless expressly noted. Additional analytes may be added. These limits may be modified where it is in the best interest of public health and safety.

### Regulatory Authority

Pursuant to the authority vested in the Cannabis Control Board (Board) by Sections 13, 43, 89, 105 and 129 of the Cannabis Law, 9 NYCRR Part 130, specifically Section 130.22 Testing of Cannabis Product and Medical Cannabis:

(a) testing of the phytocannabinoid profile in cannabis products and/or medical cannabis shall include, at a minimum, the analyte or groups of analytes specified under this Part; and

(b) testing for contaminants in cannabis product or medical cannabis shall include, but not be limited to, microorganisms, foreign material, metals, microbial impurities, moisture content and water activity, mycotoxins, pesticides, residual solvents, terpenoids, and any other analyte or group of analytes determined by the Office, consistent with the acceptable limits determined by the Office for each of the foregoing.

### Revision Record

| Date | Summary of Change |
|---|---|
| *NYS OCM Adult-Use and Medical Cannabis Testing Program* | |
| July 2024 | • Updated Cadmium limit as USP <39> was updated.<br>• Amended adult-use reference in Table 1 from guidance to regulation. |
| March 2024 | • Updated to include testing for the residual solvent, 1,1,1,2-Tetrafluoroethane (HFC-134a). Limit was set at 1000 ppm. |
| January 2024 | • Additional (CAS) registry numbers were added to some of the terpenes based on individual or mixed isomer standards available on the market. |

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| | • Clarified how terpene results are to be reported. |
| November 2023 | • CAS registry numbers were added next to each terpene.<br>• Clarified terpene limit of more than 10% is applicable to only vaporized or inhaled cannabis products. |
| October 2023 | • Clarified the limits with either a < or = sign, or both, and amended limits to significant figures based on accuracy of method.<br>• Included criteria for labeled potency variance and potency homogeneity.<br>• Included a required list of terpenes to be tested for and the limit as a % by weight.<br>• Included reporting criteria for pesticides and residual solvents that are identified as "TIC" on reports.<br>• Included clarification as to which types of products water activity is applicable to.<br>• Included clarification as to which types of products moisture content is applicable to.<br>• Added clarification for metals limit for topicals.<br>• For adult-use products, clarified vape and flower are to be reported as %cannabinoid and total THC and total CBD per package rather than per serving.<br>• Amended the limit for Nickel in AU flower products only. |
| January 2023 | • Limit for Total Aerobic Microbial Count and Total Yeast/Mold Count in adult-use products containing unextracted cannabis was changed to "Report Results only," and a footnote was added the table.<br>• For heavy metals, the parenteral column was removed and limits for Cu, Cr and Ni were changed back to those listed in the April 2022 document. |
| August 2022 | • Regulatory reference (Part 130) was included.<br>• Phytocannabinoid profile testing requirements were included.<br>• Heavy metals table was updated to include a parenteral limit and remove Zn.<br>• Changed the limits for Cu, Cr and Ni as it was stated under the April 2022, testing limits revision.<br>• List of pesticides was included along with their respective limit.<br>• Water activity, moisture content and filth & foreign material were added as regulated analytes with limits.<br>• List of residual solvents was included along with their respective limit. |
| *NYS DOH Medical Cannabis or Marijuana Testing Program (MMP)/NYS Adult-Use and Medical Cannabis Testing Program* | |
| April 2022 | • Reference changed from NYS DOH to NYS OCM.<br>• Total Aerobic Microbial Count and Total Yeast/Mold Count were added as microbiological contaminants.<br>• Reduced the number of pathogenic contaminants to Salmonella spp, Shiga toxin-producing Escherichia coli (STEC), and 4 Aspergillus species (flower and inhaled products only).<br>• With April 2022 revision, Zinc (Zn) was removed as a trace / heavy metal of concern. US Pharmacopeia (<232> and <561>) does not consider it a metal of concern requiring a limit. |

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| June 2019 | Pyrethrin I & II method was developed. |
| February 2018 | Original required testing limit document was released by NYS DOH MMP. It contained: 10 microbiological contaminants (with pseudomonas for vapor products only), mycotoxins (4 Aflatoxins & 1 Ochratoxin based on tincture/oil matrix), trace elements (9 based on oral and inhalation), and declared pesticides, herbicides, and fungicides (i.e., IBA, Azadirachtin, PBO, and Pyrethrin I & II – *method in development)*. |

**Phytocannabinoid Profile:** (Testing is required on final cannabis products.)

**Table 1**

| **Phytocannabinoid Profile** | **Medical Cannabis Product** | **Adult-Use Cannabis Product** | **Lab Result** (3 significant figures) |
|---|---|---|---|
| | Limit (+/- %) | Limit (+/- %) | |
| Tetrahydrocannabinol (THC) as Total THC of: | Pursuant to 9 NYCRR Section 113.12<br><br>Labeled potency variance is 90-110%. *** | Pursuant to 9 NYCRR Section 123.6<br>Labeled potency variance is 85-115%. | Report only as mass (mg/dose or mg/serving) and percentage (% weight) ** |
| ∆9-THC; | | | |
| ∆8-THC;* | | | |
| ∆10-THC (epimers); and* | | | |
| the optical isomer of such substances | | | |
| Tetrahydrocannabinolic acid (THCA) | | | |
| Tetrahydrocannabivarin (THCV) | | | |
| Total Cannabidiol (CBD)* | | | |
| Cannabinadiolic acid (CBDA)* | | | |
| Cannabidivarin (CBDV) | | | |
| Cannabinol (CBN) | | | |
| Cannabigerol (CBG) | | | |
| Cannabichromene (CBC) | | | |
| Any Other Marketed Phytocannabinoid | | | |

* A cannabis laboratory may report individual results for ∆9-THC ∆8-THC and ∆10-THC isomers in adult-use and medical cannabis products. Total THC must always be reported. As defined in Article 1 of the Cannabis Law, Total THC is the sum of the percentage by weight or volume measurement of tetrahydrocannabinolic acid (THCA) multiplied by 0.877, plus the percentage by weight or volume measurement of THC. Total CBD is the sum of the

percentage by weight or volume measurement of (CBD + [CBDA x 0.877]). For any other marketed phytocannabinoid, it must be calculated like Total THC and Total CBD using its acid form and 0.877 in the calculation. For bulk flower and plants forms, phytocannabinoids must be corrected for moisture content and reported on a dry weight basis.

** Adult-use cannabis flower and inhalation (vape) product results are not required to be reported on per serving or dose size. The results are reported per package.

*** An additional +/-2% lab variability is allowed to be applied for potency acceptance criteria when the total THC concentration or total CBD concentration is less than five (5) milligrams per dose. This does not apply to adult-use products.

**Homogeneity Testing for Phytocannabinoid Profile:** (Testing is required on final cannabis concentrates and edible products. It does not apply to cannabis flower.)

Five (5) samples across a cannabis product batch or lot, regardless of batch or lot size, must be tested for potency. Homogeneity must be established among three (3) consecutive batches or lots. Unless otherwise approved by the Office, the concentration of total THC and CBD in milligrams per single dose for any sample of a product submitted for testing must be within twenty-five (25) percent of the mean concentration of total THC and CBD in milligrams per single dose for that submitted lot with the exception that, for products with a specified total THC and CBD concentration less than two (2) milligrams per single dose, the concentration of each sample for that low concentration phytocannabinoid shall be within 0.5 milligrams per dose of the mean concentration.

**Microbiological Contaminants:** (Testing is required on final cannabis products.)
The regulated microbiological analytes are listed in the tables below. If a non-regulated analyte is detected, it must be identified on the final report. The laboratory is not required to report a result for a non-regulated microorganism in cfu/g or cfu/mL.

**Table 2**

| **Microorganism Analyte** | **Adult-Use Cannabis and Medical Cannabis Product Limit** |
|---|---|
| | (Presence/Absence) |
| Salmonella species | Absent |
| Shiga toxin-producing *Escherichia coli* (O157:H7 plus O26, O111, O103, O121, O45, and O145) | Absent |
| *Aspergillus fumigatus, Aspergillus flavus, Aspergillus niger, Aspergillus terreus* | Absent |

**Table 3**

| **Adult-Use Cannabis** | **Total Viable Aerobic Bacteria Count** | **Total Yeast and Mold Count** |
|---|---|---|
| | Report Results Only | |
| | (in cfu/g or cfu/mL) | (in cfu/g or cfu/mL) |
| Products containing Unextracted Cannabis* | Report Results Only | Report Results Only |
| | | |
| **Medical Cannabis Product** | **Total Viable Aerobic Bacteria Count** | **Total Yeast and Mold Count** |
| | Limit (≤) | |
| | (in cfu/g or cfu/mL) | (in cfu/g or cfu/mL) |
| Products containing Unextracted Cannabis | 100,000 or $10^5$ | 10,000 or $10^4$ |
| | | |
| **Adult-Use Cannabis and Medical Cannabis Product** | **Total Viable Aerobic Bacteria Count** | **Total Yeast and Mold Count** |
| | Limit (≤) | |
| | (in cfu/g or cfu/mL) | (in cfu/g or cfu/mL) |
| Products containing Extracted Cannabis or Infused Cannabis | 10,000 or $10^4$ | 1,000 or $10^3$ |

* Please note, that while Total Viable Aerobic Bacteria Count and Total Yeast and Mold Count tests are required, there will not be a defined limit for unextracted products (e.g., cannabis flower products) in the adult-use (AU) program. The Office will monitor these laboratory testing results and licensees may be required to conduct further testing where results indicate concerns with product quality or safety.

**Mycotoxins:** (Testing is required on all final cannabis products.)

**Table 4**

| **Mycotoxins** | **Lab Result** | **Adult-Use Cannabis and Medical Cannabis Product** |
|---|---|---|
| | | Limit (in µg/g) |
| Total Aflatoxins (Sum of Aflatoxin B1, Aflatoxin B2, Aflatoxin G1, and Aflatoxin G2, if determined individually) | Report all results in µg/g only | <0.020 |
| Ochratoxin A | | <0.020 |

**Trace / Heavy Metals:** (Testing is required on final cannabis products.)

**Table 5**

| **Trace / Heavy Metal Analyte (as a Total)** | **Lab Result** | **Oral *** | **Inhalation** |
|---|---|---|---|
| | | Adult-Use Cannabis and Medical Cannabis Product Limit (in µg/g) (≤) | |
| Antimony (Sb) | Report all results in µg/g only | 120 | 2.00 |
| Arsenic (As) | | 1.50 | 0.200 |
| Cadmium (Cd) | | 0.500 | 0.200 |
| Chromium (Cr) | | 1,100 | 110 |
| Copper (Cu) | | 300 | 30.0 |
| Lead (Pb) | | 0.500 | 0.500 |
| Mercury (Hg) | | 3.00 | 0.100 |
| Nickel (Ni) | | 20.0 | 2.00 (5.00**) |

* Please note for topicals, the applicable limits are those for oral products.

** The limit of 5.00 ug/g applies to adult-use flower and pre-roll products.

**Water Activity:** (flower and solid edible infused products only)

A laboratory must analyze dried flower batch samples to determine if the water-activity level is at or below 0.65 units. Results must be reported to two significant figures.

A cannabis laboratory must analyze solid edible infused cannabis products such as fruit chews, chocolates, and lozenges, to determine if the level is at or below 0.85 units. Results must be reported to two significant figures.

Non-edible infused products, oral liquids, and beverages are not subject to water activity testing.

**Moisture Content (Loss on Drying):** (flower product forms only)

Dried flower batch samples typically have moisture content in a range of 5.0-15.0%. Percentage must be reported to the nearest tenth. If a sample has a moisture content of greater than 15.0%, the sample is not acceptable.

**Filth and Foreign Material:** (flower product forms only)

Filth and foreign material include, but is not limited to hair, insects, feces, manufacturing waste, packaging contaminants, and by-products.

**Table 6**

| Filth and foreign material | Limit |
|---|---|
| Mammalian excreta | Not more than an average of 1mg or more per pound |
| Foreign material | Not more than an average of 5% of stems 3 mm or more in diameter or more by weight and not more than 2% of other foreign matter |

**Residual Solvents:** (Testing is required on all final cannabis products, including beverages.)

All solvents used during the production of adult use and medical cannabis product must be declared for targeted testing. A licensee or registered organization may be required to submit samples for additional testing, including testing for analytes that are not listed below.

Please note that the lack of individual and mixed standards may not be commercially available for all the residual solvents listed below. If this is the case, it will make quantitation of individual peaks challenging and some isomers may co-elute. Where applicable, results should be reported as "tentatively identified, but not quantitatively confirmed." Place "TIC" as the result and define the term in the footnote of the report.

**Table 7**

| **Residual Solvent Analyte** | **CAS Registry Number** | **Class #[1]** | **Adult-Use Cannabis and Medical Cannabis Product Limit** (≤) (in ug/g = ppm) |
|---|---|---|---|
| 1,2-Dichloroethane (Ethylene dichloride, Ethylene chloride) | 107-06-2 | 1 | 5.00 |
| 2-Propanol (Isopropanol, Isopropyl alcohol) | 67-63-0 | 3 | 5000 |
| Acetone (2-Propanone) | 67-64-1 | 3 | 5000 |
| Acetonitrile | 75-05-8 | 2 | 410 |
| Butanes, Total | 106-97-8, 75-28-5 | n/a | 5000 |
| Benzene | 71-43-2 | 1 | 2.00 |
| Chloroform | 67-66-3 | 2 | 60.0 |
| Dichloromethane (Methylene chloride) | 75-09-2 | 2 | 600 |
| Dimethyl sulfoxide (DMSO) | 67-68-5 | 3 | 5000 |
| Ethanol (Ethyl alcohol) | 64-17-5 | 3 | 5000 |
| Ethyl acetate (Acetic acid ethyl ester) | 141-78-6 | 3 | 5000 |
| Ethyl ether (Diethyl ether, 1,1'-Oxybisethane) | 60-29-7 | 3 | 5000 |

[1] Class 1 are solvents to be avoided. Class 2 are solvents to be limited. Class 3 are solvents with low toxic potential.

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|---|---|---|---|
| Heptane (n-Heptane) | 142-82-5 | 3 | 5000 |
| Hexanes, Total | 110-54-3, 107-83-5, 96-14-0, 75-83-2, 79-29-8 | 2 | 290 |
| Methanol (Methyl alcohol) | 67-56-1 | 2 | 3000 |
| Pentanes, Total | 109-66-0, 78-78-4, 463-82-1 | 3 | 5000 |
| Propane | 74-98-6 | n/a | 5000 |
| Tetrafluoroethane (1,1,1,2-) (HFC-134a) | 811-97-2 | n/a | 1000 |
| Toluene (Methylbenzene) | 108-88-3 | 2 | 890 |
| Trichloroethane (1,1,1-) | 71-55-6 | 1 | 1500 |
| Xylenes, Total (ortho-, meta-, para-) | 95-47-6, 108-38-3, 106-42-3 | 2 | 2170 |

**Pesticides, including Growth Regulators and Myclobutanil:** (Testing is required on all final cannabis products, including beverages.)

Any pesticide, including growth regulators and myclobutanil, used during production of an adult use and medical cannabis product must be declared for targeted testing. Targeted testing will be supplemented by the testing of the following pesticide contaminants and their limits. A licensee or registered organization may also be required to submit samples for additional testing, including testing for analytes that are not listed below.

Please note that the lack of individual and mixed standards may not be commercially available for all the pesticides listed below. If this is the case, it will make quantitation of individual peaks challenging and some isomers may co-elute. Where applicable, the results should be reported as *"tentatively identified, but not quantitatively confirmed."* Place "TIC" as the result for that pesticide, and define the term in the footnote of the report.

**Table 8**

| **Pesticide Analyte** | **CAS Registry Number** | **Adult-Use Cannabis and Medical Cannabis Product Limit** (≤) **(in ppm = 1 µg/g)** |
|---|---|---|
| Abamectin | 71751-41-2 | 0.500 |
| Acephate | 30560-19-1 | 0.400 |

| | | |
|---|---|---|
| Acequinocyl | 57960-19-7 | 2.00 |
| Acetamiprid | 135410-20-7 | 0.200 |
| Aldicarb | 116-06-3 | 0.400 |
| Azadirachtin | 11141-17-6 | 1.00 |
| Azoxystrobin | 131860-33-8 | 0.200 |
| Bifenazate | 149877-41-8 | 0.200 |
| Bifenthrin | 82657-04-3 | 0.200 |
| Boscalid | 188425-85-6 | 0.400 |
| Captan | 133-06-2 | 1.00 |
| Carbaryl | 63-25-2 | 0.200 |
| Carbofuran | 1563-66-2 | 0.200 |
| Chlorantraniliprole | 500008-45-7 | 0.200 |
| Chlordane | 57-74-9 | 1.00 |
| Chlorfenapyr | 122453-73-0 | 1.00 |
| Chlormequat chloride | 999-81-5 | 1.00 |
| Chlorpyrifos | 2921-88-2 | 0.200 |
| Clofentezine | 74115-24-5 | 0.200 |
| Coumaphos | 56-72-4 | 1.00 |
| Cyfluthrin | 68359-37-5 | 1.00 |
| Cypermethrin | 52315-07-8 | 1.00 |
| Daminozide | 1596-84-5 | 1.00 |
| Diazinon | 333-41-5 | 0.200 |
| Dichlorvos (DDVP) | 62-73-7 | 1.00 |
| Dimethoate | 60-51-5 | 0.200 |
| Dimethomorph | 110488-70-5 | 1.00 |
| Ethoprop(hos) | 13194-48-4 | 0.200 |
| Etofenprox | 80844-07-1 | 0.400 |
| Etoxazole | 153233-91-1 | 0.200 |
| Fenhexamid | 126833-17-8 | 1.00 |
| Fenoxycarb | 72490-01-8 | 0.200 |
| Fenpyroximate | 111812-58-9 | 0.400 |
| Fipronil | 120068-37-3 | 0.400 |
| Flonicamid | 158062-67-0 | 1.00 |
| Fludioxonil | 131341-86-1 | 0.400 |
| Hexythiazox | 78587-05-0 | 1.00 |
| Imazalil | 35554-44-0 | 0.200 |
| Imidacloprid | 138261-41-3 | 0.400 |
| Indole-3-butyric acid | 133-32-4 | 1.00 |
| Kresoxim-methyl | 143390-89-0 | 0.400 |
| Malathion | 121-75-5 | 0.200 |
| Metalaxyl | 57837-19-1 | 0.200 |

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|---|---|---|
| Methiocarb | 2032-65-7 | 0.200 |
| Methomyl | 16752-77-5 | 0.400 |
| Methyl parathion | 298-00-0 | 0.200 |
| Mevinphos | 7786-34-7 | 1.00 |
| MGK-264 | 113-48-4 | 0.200 |
| Myclobutanil | 88671-89-0 | 0.200 |
| Naled | 300-76-5 | 0.500 |
| Oxamyl | 23135-22-0 | 1.00 |
| Paclobutrazol | 76738-62-0 | 0.400 |
| Pentachloronitrobenzene | 82-68-8 | 1.00 |
| Permethrins, Total | 52645-53-1, 54774-45-7, 51877-74-8 | 0.200 |
| Phosmet | 732-11-6 | 0.200 |
| Piperonyl butoxide | 51-03-6 | 2.00 |
| Prallethrin | 23031-36-9 | 0.200 |
| Propiconazole | 60207-90-1 | 0.400 |
| Propoxur | 114-26-1 | 0.200 |
| Pyrethrins[2] | 8003-34-7 | 1.00 |
| Pyridaben | 96489-71-3 | 0.200 |
| Spinetoram, Total | 187166-15-0, 187166-40-1 | 1.00 |
| Spinosad, Total | 131929-60-7, 131929-63-0 | 0.200 |
| Spiromesifen | 283594-90-1 | 0.200 |
| Spirotetramat | 203313-25-1 | 0.200 |
| Spiroxamine | 118134-30-8 | 0.200 |
| Tebuconazole | 107534-96-3 | 0.400 |
| Thiacloprid | 111988-49-9 | 0.200 |
| Thiamethoxam | 153719-23-4 | 0.200 |
| Trifloxystrobin | 141517-21-7 | 0.200 |

[2] As the cumulative of Pyrethrin 1, Cinerin 1 and Jasmolin 1 (CAS numbers 121-21-1, 25402-06-6 and 4466-14-2, respectively)

**Terpenoids:** (Testing is required on all final cannabis products, including beverages.)

Terpenoids or terpenes are primarily responsible for the aroma of cannabis. All cannabis products must be tested for terpene content.

Vaporized or inhaled cannabis products cannot exceed more than ten (10) percent total terpenes.

The terpenoids shall be reported in a percentage (by weight). Percentage reported must be based on the readability of the analytical balance used to prepare samples for terpene analysis. For example, a sample was weighed on a balance that reads to 0.001 g; therefore, the result must be reported to 0.001%.

The terpenes listed below are included in current certified reference material (CRM). At a minimum, the following terpenes shall be tested.

**Table 9**

| Terpenoid or Terpene (% by weight) | CAS Registry Number | Additional CAS Registry Number and/or Terpene Name |
|---|---|---|
| Beta (β)-myrcene | 123-35-3 | |
| Beta (β)-caryophyllene | 87-44-5 | Trans-caryophyllene |
| Limonene | 5989-27-5 | (R)-(+)-Limonene; d-Limonene |
| Alpha (α)-pinene | 80-56-8 | |
| Alpha (α)-humulene | 6753-98-6 | |
| Linalool | 78-70-6 | |
| Beta (β)-pinene | 127-91-3 | (-)-β-Pinene as 18172-67-3 |
| Terpinolene | 586-62-9 | |
| Ocimene | 13877-91-3 | Ocimene (mix of isomers); Beta (β)-ocimene |
| Alpha (α)-bisabolol | 23089-26-1 | (-)-α-Bisabolol |
| Caryophyllene-oxide | 1139-30-6 | (-)-Caryophyllene oxide |
| Geraniol | 106-24-1 | |

| | | |
|---|---|---|
| Camphene | 79-92-5 | |
| Guaiol | 489-86-1 | (-)-Guaiol |
| Alpha (α)-terpinene | 99-86-5 | |
| Terpineol (mix of isomers) | 8000-41-7 | alpha (α)-Terpineol [or (-)-alpha-Terpineol] as 98-55-5 |
| Fenchol | 2217-02-9 | (1R)-endo-(+)-Fenchyl alcohol |
| Valencene | 4630-07-3 | (+)-Valencene |
| Alpha (α)-phellandrene or p-Mentha-1,5-diene | 99-83-2 | R-(-)-α-Phellandrene as 4221-98-1 |
| Farnesene (mix of isomers) | 502-61-4 | Trans-β-Farnesene as 18794-84-8 |