VERMONT
CANNABIS CONTROL BOARD
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LABORATORY TESTING ACTION LIMITS AND PARAMETERS GUIDANCE: WATER ACTIVITY PATHOGENS PESTICIDES TERPENES HEAVY METALS RESIDUAL SOLVENTS

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Introduction

The Vermont Cannabis Control Board maintains parameters and action limits for testing cannabis that effect both the medical and the adult use market. Potency parameters and Water Activity requirements are found in CCB Rule 2.9. Human pathogen, metal, pesticide, and residual solvent parameters and limits are set through Board guidance pursuant to Rule 2.3.3 and found below. Such guidance will not be altered without at least 90 days of notice to licensees and the general public.

Testing Requirements by product type:

Smokeable Flower

a. Potency
b. Pathogens
c. Pesticides*
d. Water Activity
e. Soil heavy metals every 3 years

*For pesticide analysis, Harvest Lot Samples that are multiple cultivars shall have the cultivars submitted individually and then may be comingled by the laboratory for up to five (5) cultivars. Individual cultivar analysis will be performed for potency and pathogens.

Fresh/Frozen Biomass and Flower

a. Pesticides
b. Pathogens

Solvent Extracted Concentrates

(All COAs from underlying flower must be appended to the transfer form in inventory tracking)

a. Potency
b. Heavy Metals
c. Pesticides
d. Residual Solvent

Mechanically Extracted Solvents

(All COAs from underlying flower must be appended to the transfer form in inventory tracking)

a. Potency
b. Pathogens

Edible Products

(All COAs from underlying flower or concentrate must be appended to the transfer form in inventory tracking)

a. Potency

b. Intra-batch consistency testing (beginning, middle, and end) must be completed for manufacturers. Testing schedule is based on license tier and described in next section.

Topical Products

(All underlying flower or concentrate COAs must be appended to the transfer form in inventory tracking)

a. Potency

See Cannabis Testing Requirements for a short form version on the testing requirements for various product types.

https://ccb.vermont.gov/sites/ccb/files/2023-10/Lab.Testing.Requirements_Oct2023FINAL.pdf

Intra-Batch Consistency Testing:

Pursuant to Rule 2.9.1(e), all edible products must undergo consistency testing to ensure potency homogeneity. The schedule for this testing is determined based on the licensee's tier, as described below.

Tier 3

1. Provide inventory of all products organized by product group.
2. Develop schedule so batch consistency testing is completed on at least one product from each product group every month.
3. Each individual product must be included in batch consistency testing at least once per year.
4. Batch consistency records must be included with annual product registration renewal.

Tier 2

1. Provide inventory of all products organized by product group.
2. Develop schedule so batch testing is completed on at least one product from each product group is tested for batch potency consistency every 3 months.
3. Each individual product must be included in batch consistency testing at least once per year.
4. Batch consistency records must be included with annual product registration renewal.

Tier 1

1. Provide inventory of all products organized by product group.
2. Each individual product must be included in batch consistency testing at least once per year.
3. Batch consistency records must be included with annual product registration renewal.

Water Activity

Cannabis Flower must have a Water Activity (a_w) test of .65 or lower in order to be registered as smokable flower. The Board may request a a_w analysis of other cannabis products to help determine if additional product assessment for microbiological hazards is needed. Manufacturers may need to work with a Process Authority to complete additional testing and product evaluation to determine the specific a_w requirement for a particular product. To determine whether or not your product will need process authority review, reach out to your compliance agent or email product registration at CCB.Products@Vermont.gov

Potency

All cannabis and cannabis products must undergo a potency test before they can be registered for retail sale. Flower for retail sale may not exceed 30% THC content. Solid concentrates offered for retail sale may not exceed 60% THC content.

Pathogen Testing

All flower must be tested for pathogens.
All mechanically extracted concentrates to be sold at retail must also undergo pathogen testing.

Microbiological Parameters and Limits

Parameter	Action limits for trim flower	Action limits for concentrates	Action limits for products and infused products
Shiga--toxin producing Escherichia coli (STEC) – Bacteria	None Detected	None Detected	None Detected
Salmonella species – Bacteria	None Detected	None Detected	None Detected
Aspergillus fumigatus, Aspergillus flavus, Aspergillus niger, Aspergillus terreus – Fungus	None Detected	None Detected	None Detected

Microbial testing for cannabis and cannabis products shall be analyzed by the following **allowable methods**:

1. A validated method using guidelines for food and environmental testing put forth by the USP, FDA, and AOAC Appendix J and cannabis as a sample type; or

2. Another approved AOAC, FDA, or validated method using cannabis as a sample type. NOTE: "Another approved AOAC, FDA, or USP validated method using cannabis as a sample type" may include molecular methods, such as qPCR.

Aspergillus Testing and Remediation Pathway

1. Initial aspergillus testing must analyze for both live and free DNA. Initial testing **may not** eliminate free aspergillus DNA from the sample.

2. If first sample is negative for aspergillus, product may move through the channels of trade.

3. If first sample is positive for aspergillus, licensee may submit up to 2 additional samples for confirmation testing. Of the 2 additional samples, one positive test result will confirm the product is positive for aspergillus. If both additional samples test negative, the product will be confirmed negative for aspergillus.

4. For product that is confirmed positive for aspergillus, the following protocols apply:

    a. Intra-supply chain packaging of the product must be labeled as *"Aspergillus Positive."* *"Aspergillus Positive"* must also be noted on the transfer form.

    b. Product may:
        i. Be remediated and retested as described in (c)-(e) below OR
        ii. Be offered for solvent-based extraction for edible or topical products.

    c. Remediated product must also be tested for the following mycotoxins:
        i. Aflatoxin B1, B2, G1 and G2
        ii. Ochratoxins A

    d. If product is remediated, it must be retested before it may be offered for retail sale. Post-remediation testing may use testing procedures that eliminate free aspergillus DNA from the sample.

    e. Remediated product that tests negative for mycotoxins and negative for aspergillus may be offered for sale as smokable flower and no longer needs to be labeled as *"Aspergillus Positive."*

Metal Parameters and Limits

Parameter	Action limits for harvest lot and trim flower (ppm, mg/kg)	Action limits for concentrates, products and infused products (ppm, mg/kg, mg/l)	Action limits for soil (ppm, mg/kg) for agricultural use (additional levels for Cr, Cu, Ni, and Zn, see Note 1)
Arsenic	0.200	1.500	---
Cadmium	0.200	0.500	0.43
Lead	0.500	1.000	200
Mercury	0.100	1.500	---

Note 1: Soil action limits for Agricultural use, (NYSDEC) as referenced in UVM table 2 : http://www.uvm.edu/vtvegandberry/factsheets/interpreting_heavy_metals_soil_tests.pdf

Additional levels must also be met for Chromium (11 ppm), Copper (270), Nickel (72 ppm) and Zinc (1100 ppm).

Parameter	Action limits for concentrates, products, and infused products (ppm, mg/kg, mg/l)
Acetone	5000
Acetonitrile	410
Benzene	2
Butane	0 **
Chloroform	60
Ethanol	5000 *
Heptanes (total)	5000
Hexanes (total)	0**
Isopropyl alcohol	5000
Methanol	3000
Methylene Chloride	600
Propane	5000
Toluene	890
Xylenes (total)	2170
Any solvent not permitted for extraction	5000

Residual Solvent Parameters and Limits

* Ethanol Action Limits do not apply to products where ethanol in the carrier i.e., Tinctures.

** Butane and hexane extraction is prohibited by 18 V.S.A. § 4230h.

Pesticide Parameters and Limits

Parameter	Action limits for harvest lots, trim flower, concentrates, products and infused products (ppm, mg/kg, mg/l)
Acephate	0.1
Acequinocyl	0.1
Abamectin (each isomer)	0.1
Azoxystrobin	0.1
Bifenazate	0.1
Bifenthrin	3.0
Carbaryl	0.5
Chlorpyrifos	0.04
Cypermethrin (zeta) sum of isomers	1.0
Etoxazole	0.1
Imazalil	0.04
Imidacloprid	5.0
Myclobutanil	0.1
Pyrethrins I and II (sum of isomers)	0.5
Spinosyn (each for Spinosad A & D)	0.1

Terpene Testing Requirements

Pursuant to Rule 2.6.4(c), the total terpene content of a cannabis product **intended for inhalation or vaporization** may not exceed **10 percent by weight**. All terpenes added to a cannabis product must be naturally occurring in the cannabis plant. This may include terpenes that occur naturally in the cannabis plant but are derived from a non-cannabis botanical. Any addition of terpenes may not have the result of creating product with a characterizing flavor not naturally occurring in cannabis.

Any concentrated terpenes added to a cannabis product shall be disclosed on the label.

A terpene test is required for the following products offered for retail sale:

1. Concentrates intended for inhalation or vaporization that have been decarboxylated.
2. Any product in which terpenes have been removed and reintroduced.
3. Any product with added terpenes.
4. Any product that indicates terpene content on the label.

A final product offered for retail sale with a terpene content that exceeds 10 percent by weight of the total product may be submitted to the Board for product registration review. If the terpene profile of the underlying flower demonstrates that the excess terpene content is not the result of additives, the high terpene product may be approved and the product may be registered.

To register a product with a high terpene content:

1. Submit the following documents with your product registration:
    a. Terpene profile of the final product, and
    b. Terpene profile of the underlying flower used to create the product.

2. Complete a rules waiver request form indicating that you are seeking a waiver of rule 2.6.4 here: https://ccb.vermont.gov/rulewaiver

You will be notified through product registration whether your rule waiver request has been granted.

Reporting Requirements

Pursuant to Board Rule 2.2.19, licensees must make a prompt report to the Board upon discovery of adulterated cannabis or cannabis product, regardless of cause or fault. This includes cannabis/cannabis products with test results exceeding the action limits set forth in this guidance. Licensed laboratories must promptly notify the Board of non-compliant final test results by email at: ccb.compliance@vermont.gov with a subject line of: Actionable Test Results.