

How to Decipher a Certificate of Analysis

CoAs: Why They Matter And How You Can Interpret one!

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About Sativa Remedy & What We Do

Organically Farmed • Whole Plant Derived • USA Grown



SATIVA REMEDY
Industrial Hemp Dispensary
Trusted professionals that provide FREE hemp consultations

Hemp Tinctures, Topicals, Flowers, & Prerolls
716-260-1324
Open 7 days a week
19 Main Street



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Why Is It Important ?

LEGALITY & SAFETY

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The Basics

- ▶ Verifiably third party tested
- ▶ Look for CBD
- ▶ Look for THC (should be less than 0.3%)
- ▶ Accurate Potency (should be equal or greater than product label)

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Validity



Lazarus Naturals

HPTN BF02(B)

HIGH POTENCY TINCTURE Serving Size: 1 ml

PIXIS Labs Oregon Accreditation: OR100028

NR: Not Reported
 ND: Not Detected
 LOQ: Limit Of Quantitation
 1 g = 10³ kg = 10⁶ mg = 10⁹ µg
 1 mg/kg = 1 ppm = 1000 ppb

POTENCY	PER SERVING	PER GRAM	REGULATORY ACTION LEVEL
Cannabidiol (CBD)	54.20 mg/serving	58.22 mg/g	N/A
Total THC(Δ9-THC + δ8-THC)	2.31 mg/serving	2.48 mg/g	3 mg/g
Cannabigerol (CBG)	1.78 mg/serving	1.91 mg/g	N/A
Cannabinol (CBN)	<LOQ	<LOQ	N/A
Cannabichromene (CBC)	2.24 mg/serving	2.41 mg/g	N/A

HEAVY METALS	PER SERVING	REGULATORY ACTION LEVEL
Arsenic	<LOQ	10 µg/day ^{III}
Cadmium	<LOQ	4.1 µg/day ^{III}
Lead	<LOQ	3.5 µg/day ^{III}
Mercury	<LOQ	2 µg/day ^{III}


PESTICIDES	REGULATORY ACTION LEVEL
None of the 59 pesticides tested found above limit of detection in the sample.	10 ppb ^{III}



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Validity



PIXIS Labs
A Tentamus Company

12423 NE Whitaker Way
 Portland, OR 97230
 503-254-1794

Job Number: 19-008348
Report Number: 19-008348-00
Report Date: 07/22/2019
ORELAP#: OR100028
Purchase Order:
Received: 07/16/19 10:44

This report cannot be used for ODA, OHA or OLCC compliance requirements.

Product identity: BF02(B) HPTN Bottom

Client/Metric ID: .

Laboratory ID: 19-008348-0003

Sample Date: 07/15/19

Summary

Potency:				
Analyte per 1ml	Result	Limits	Units	LOQ
CBC per 1ml	2.24		mg/1ml	0.93
CBD per 1ml	54.2		mg/1ml	0.93
CBG per 1ml	1.78		mg/1ml	0.93
Δ9-THC per 1ml	2.31		mg/1ml	0.93

CBD-Total per 1ml	54.2 mg/1ml
THC-Total per 1ml	2.31 mg/1ml

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Determine type of CBD product

- ▶ CBD Isolate
 - ▶ Cannabinoids present: CBD
- ▶ CBD Broad Spectrum
 - ▶ Cannabinoids present: CBD,
 - ▶ Minor cannabinoids CBN, CBG, CBC
 - ▶ Zero trace of THC, THCA
- ▶ CBD Full Spectrum
 - ▶ All cannabinoids can be present, but there are notable trace amounts of THC (<0.3%)

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CBD Isolate - Cannabinoids present: CBD



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CBD Isolate - Cannabinoids present: CBD

Potency Analysis

Analytical Method: De Backer, Journal of Chromatography b.2009, 11.004 - SOP 19 and 20

Cannabinoids (% weight)		Notes
THCA	< LOQ	
delta 9-THC	< LOQ	
delta 8-THC	< LOQ	
CBGA	< LOQ	
CBDA	< LOQ	
CBD	5.25	
CBN	< LOQ	
CBG	< LOQ	
CBC	< LOQ	

Total THC
< LOQ %

Total CBD
5.25 %

<LOQ - Results below the Limit of Quantitation

Acid form of THC/CBD are decarboxylated by heat, lose 12% of original mass as CO2. Result = "bioactive"

Total Cannabinoid accounts for decarboxylation and moisture content. Total THC = [(THCA*0.877) + Δ9THC] / (100%-MC)

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CBD Broad Spectrum - Cannabinoids present: Variety of cannabinoids, but lack THC

Cannabinoid Test Results **04/14/2019**

Cannabinoid analysis utilizing High Performance Liquid Chromatography (HPLC, QSP 5-4-4-4)

	mg/g	%	LOD mg/g	LOQ mg/g
THC	ND	ND	0.052	0.158
THCa	ND	ND	0.052	0.156
CBD	740.212	74.0212	0.052	0.158
CBDA	0.185	0.0185	0.052	0.156
CBN	5.531	0.5531	0.052	0.157
CBDV	4.039	0.4039	0.021	0.063
CBDAa	ND	ND	0.037	0.111
CBG	3.915	0.3915	0.030	0.092
CBGa	ND	ND	0.044	0.133
THCV	ND	ND	0.023	0.069
Δ8-THC	ND	ND	0.053	0.162
CBC	13.631	1.3631	0.031	0.094
THCVa	ND	ND	0.091	0.276
CBL	ND	ND	0.130	0.393
CBCa	ND	ND	0.129	0.392

Sum of Cannabinoids: 767.513 76.7513

Total THC (Δ9THC+0.877*THCa) ND ND

Total CBD (CBD+0.877*CBDA) 740.374 74.0374

Action Limit mg

THC per Unit
THC per Serving

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CBD Full Spectrum (basic) - Variety of cannabinoids including trace amounts of THC

Potency Test Results

Full spectrum cannabinoid profiling and analysis via High Pressure Liquid Chromatography with a Diode Array Detector (HPLC/DAD).

Cannabinoid Profile – per gram of material

Tetrahydrocannabinolic Acid	THC-A	Not Detected
Tetrahydrocannabinol	Δ9THC	0.31 mg/g
Cannabidiolic Acid	CBDA	5.20 mg/g
Cannabidiol	CBD	18.6 mg/g
Cannabigerol	CBG	Not Detected
Cannabinol	CBN	Not Detected
Total Cannabinoids:		24.1 mg/g

Percent THC by Weight 0.031% per gram

Total CBD: 23.8 mg/g



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CBD Full Spectrum (high quality) - Variety of cannabinoids including trace amounts of THC

Sample Results

Potency per 1ml		Batch: 1906401					
Analyte	Result	Limits	Units	LOQ	Analyze	Method	Notes
CBC per 1ml	2.24		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBC-A per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBC-Total per 1ml	2.24		mg/1ml	1.75	07/22/19	J AOAC 2015 V98-6	
CBD per 1ml	54.2		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBD-A per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBD-Total per 1ml	54.2		mg/1ml	1.75	07/22/19	J AOAC 2015 V98-6	
CBDV per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBDV-A per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBDV-Total per 1ml	< LOQ		mg/1ml	1.74	07/22/19	J AOAC 2015 V98-6	
CBG per 1ml	1.78		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBG-A per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBG-Total per 1ml	1.78		mg/1ml	1.75	07/22/19	J AOAC 2015 V98-6	
CBL per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
CBN per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
Δ8-THC per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
Δ9-THC per 1ml	2.31		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
THC-A per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
THC-Total per 1ml	2.31		mg/1ml	1.75	07/22/19	J AOAC 2015 V98-6	
THCV per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
THCV-A per 1ml	< LOQ		mg/1ml	0.931	07/22/19	J AOAC 2015 V98-6	
THCV-Total per 1ml	< LOQ		mg/1ml	1.74	07/22/19	J AOAC 2015 V98-6	

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Hemp is a Bioaccumulator

- ▶ “Phytoremediation can be used to remove radioactive elements from soil and water at former weapons producing facilities,” explained Elaine Charkowski for Central Oregon Green Pages in winter of 1998. “It can also be used to clean up metals, pesticides, solvents, explosives, crude oil, polyaromatic hydrocarbons, and toxins leaching from landfills.”

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Additional Testing: Heavy Metals/Pesticides



12423 NE Whitaker Way
Portland, OR 97230
503-254-1794

Job Number: 19-008348
Report Number: 19-008348-00
Report Date: 07/30/2019
ORELAP#: OR100028
Purchase Order:
Received: 07/16/19 10:44



This report cannot be used for ODA, OHA or OLCC compliance requirements.

Customer: Eitz Hayim Holdings

Product Identity: BF02(B) HPTN
Client/Metric ID: .
Sample Date: 07/15/19
Laboratory ID: 19-008348-0008
Relinquished by: Received By Mail
Temp: 25.3 °C

Sample Results								
Metals								
Analyte	Result	Limits	Units	LOQ	Batch	Analyze	Method	Notes
Arsenic	< LOQ		mg/kg	0.0501	1906652	07/24/19	AOAC 2013.06	X
Cadmium	< LOQ		mg/kg	0.0501	1906652	07/24/19	AOAC 2013.06	X
Lead	< LOQ		mg/kg	0.0501	1906652	07/24/19	AOAC 2013.06	X
Mercury	< LOQ		mg/kg	0.0251	1906652	07/24/19	AOAC 2013.06	X

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Additional Testing: Heavy Metals/Pesticides

Received: 07/05/19 11:13

This report cannot be used for ODA, OHA or OLCC compliance requirements.

Customer: Elz Hayim Holdings

Product Identity: B008 TBTN

Client/Metric ID: -

Sample Date: 07/03/19

Laboratory ID: 19-00706-008

Relinquished by: Received By Mail

Temp: 24.3 °C

Sample Results

Pesticides		Method A OAC 2007.01 & EN 15662 (max)	Units mg/kg	Batch 1906358	Analyse 07/17/19 09:38 AM
Analyte	Result	Limits	LOG	Status	Notes
Abamectin	<LOQ	0.50	0.250	pass	
Azinphosmethyl	<LOQ	2.0	1.00	pass	
Aldicarb	<LOQ	2.40	0.200	pass	
Bifenoxate	<LOQ	2.20	0.100	pass	
Bioassad	<LOQ	2.40	0.100	pass	
Carbofuran	<LOQ	2.20	0.100	pass	
Chlorfenvinphos	<LOQ	1.0	0.500	pass	
Cyfluthrin	<LOQ	2.20	0.100	pass	
Cypermethrin	<LOQ	1.0	0.500	pass	
Diazinon	<LOQ	2.20	0.100	pass	
Dimethoate	<LOQ	2.20	0.100	pass	
Ethofenprox	<LOQ	2.40	0.200	pass	
Fenoxycarb	<LOQ	2.20	0.100	pass	
Fipronil	<LOQ	2.40	0.200	pass	
Fludioxonil	<LOQ	2.40	0.200	pass	
Imazalil	<LOQ	2.20	0.100	pass	
Kresoxim-methyl	<LOQ	2.40	0.200	pass	
Makthiazyl	<LOQ	2.20	0.100	pass	
Methidathion	<LOQ	2.40	0.200	pass	
Myllobutanol	<LOQ	2.20	0.100	pass	
Thiamet	<LOQ	1.0	0.500	pass	
Prallethrin-Methy	<LOQ	2.20	0.200	pass	
Phosmet	<LOQ	2.20	0.100	pass	
Prallethrin	<LOQ	2.20	0.100	pass	
Propoxur	<LOQ	2.20	0.100	pass	
Pyridaben	<LOQ	2.20	0.100	pass	
Spiromesifen	<LOQ	2.20	0.100	pass	
Spiromesifen	<LOQ	2.40	0.200	pass	
Thiaciprid	<LOQ	2.20	0.100	pass	
Tifluthiazin	<LOQ	2.20	0.100	pass	
Anaphate	<LOQ	0.40	0.200	pass	
Azinphosmethyl	<LOQ	0.20	0.100	pass	
Azinphosmethyl	<LOQ	0.20	0.100	pass	
Chlorpyrifos	<LOQ	0.20	0.100	pass	
Cyfluthrin (ind)	<LOQ	1.0	0.500	pass	
Deltamethrin	<LOQ	1.0	0.500	pass	
Deltamethrin	<LOQ	1.0	0.500	pass	
Ethioniazole	<LOQ	0.20	0.100	pass	
Fenprophidate	<LOQ	0.40	0.200	pass	
Fipronil	<LOQ	1.0	0.400	pass	
Hexafluzole	<LOQ	1.0	0.400	pass	
Imidacloprid	<LOQ	0.40	0.200	pass	
Malathion	<LOQ	0.20	0.100	pass	
Methidathion	<LOQ	0.20	0.100	pass	
MGK-004	<LOQ	0.20	0.100	pass	
Naled	<LOQ	0.50	0.250	pass	
Permethrin	<LOQ	0.40	0.200	pass	
Piperonyl butoxide	<LOQ	2.0	1.00	pass	
Propiconazole	<LOQ	0.40	0.200	pass	
Pyrethrin (total)	<LOQ	1.0	0.500	pass	
Spinosad	<LOQ	0.20	0.100	pass	
Spirotetramat	<LOQ	0.20	0.100	pass	
Tebuconazole	<LOQ	0.40	0.200	pass	
Thiamethoxam	<LOQ	0.20	0.100	pass	

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Diving Deeper

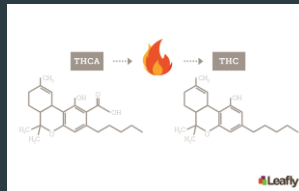
- ▶ Smokable Hemp Flowers are increasing in popularity.
- ▶ Consumers need to be aware of the contents of their hemp CBD flowers.
- ▶ Growing strains of hemp
 - ▶ Often times, CBD rich strains naturally low levels in THC will be bred with industrial hemp strains to produce smokable hemp flowers that read below 0.3% THC

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Here's the Tea: THC vs THCA

- ▶ Government regulates: Delta-9 THC
 - ▶ 2018 US Farm Bill amended Sec.297A
 - ▶ Delta-9 THC must be lower than 0.3% dry weight
- ▶ THCA
 - ▶ Acid form of THC
 - ▶ Can be converted to THC through
 - ▶ Time
 - ▶ Sunlight
 - ▶ Heat (aka lighter)



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If you didn't catch that ...

- ▶ When using smokable hemp flowers is exposed to a lighter or enough heat, the THCA that is present in the hemp flower will convert to THC
- ▶ Note: Even with high levels of THC from the conversion, this is still not enough to cause any psychoactivity or intoxication

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BoAx x Cherry



The data contained within this report was collected in accordance with the requirements of ISO/IEC 17025:2005. I attest that the information contained within the report has been reviewed for accuracy and checked against the quality control requirements for each method. These results relate only to the test article listed in this report. Reports may not be reproduced except in their entirety.

CN: Cannabinoid Profile & Potency [W1-10-17] Analyst: LG Test Date: 12/12/2018

The client sample was analyzed for plant-based cannabinoids by Liquid Chromatography (LC). The collected data was compared to data collected for certified reference standards at known concentrations.

43701-CN

ID	Weight %	Conc.
D9-THC	ND	ND
THCV	ND	ND
CBD	ND	ND
CBDV	ND	ND
CBG	ND	ND
CBC	0.02 wt %	0.20 mg/g
CBN	ND	ND
THCA	0.70 wt %	6.97 mg/g
CBDA	20.51 wt %	205.10 mg/g
CBGA	0.42 wt %	4.21 mg/g
Total	21.65 wt%	216.48 mg/g
Max THC	0.61 wt%	6.11 mg/g
Max CBD	17.99 wt%	179.87 mg/g

Dry Weight Results

CBD - ND
 CBDA- 20.51% wt
 D9-THC - ND
 THCA - 0.7% wt

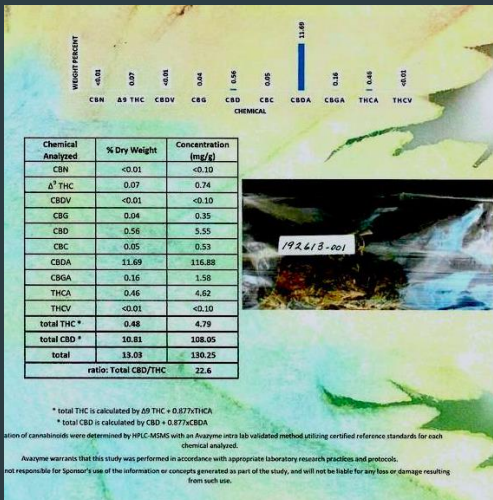
Total Potency Results

Max THC - 6.11 mg/g
 Max CBD - 179 mg/g

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Indoor Kush



Potency Results

CBD - 0.56% wt
 CBDA - 11.69% wt
 D9-THC - 0.07%
 THCA - 0.46% wt

Total THC:
 4.79 mg/g

Total CBD:
 130 mg/g

* total THC is calculated by Δ9-THC + 0.877*THCA
 * total CBD is calculated by CBD + 0.877*CBDA
 All cannabinoid concentrations were determined by HPLC-MS/MS with an Avayme in-house lab validated method utilizing certified reference standards for each chemical analyzed.
 Avayme warrants that this study was performed in accordance with appropriate laboratory research practices and protocols.
 Avayme is not responsible for Sponsor's use of the information or concepts generated as part of the study, and will not be liable for any loss or damage resulting from such use.

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As a retailer ...

- ▶ Importance of being able to interpret CoAs
- ▶ Legality of hemp CBD products
- ▶ Protect consumer wellbeing
- ▶ Know your products

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Warning to Hemp CBD Retailers - CuraLeaf Incident

- ▶ FDA states that ...
 - ▶ Based on our review of your website, your “CBD Lotion,” “CBD Pain-Relief Patch,” “CBD Tincture,” and “CBD Disposable Vape Pen” products are drugs under section 201(g)(1) of the FD&C Act, 21 U.S.C. 321(g)(1), because they are intended for use in the diagnosis, cure, mitigation, treatment, or prevention of disease and/or intended to affect the structure or any function of the body.
 - ▶ Examples of claims observed on your website and social media accounts in April 2019 that establish the intended use of your products as drugs include, but may not be limited to, the following:
 - ▶ On your product webpage for CBD Disposable Vape Pen (Relieve):
 - “[F]or chronic pain.”
 - ▶ On your product webpage for CBD Tincture (Relieve):
 - “[S]oothing tincture for chronic pain.”

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Sources

- ▶ COAs
 - ▶ Lazarus Naturals
 - ▶ MedTerra
 - ▶ Meadow Hawk Medicinals
 - ▶ Blue Ridge Hemp Co
- ▶ Hemp as a Bioaccumulator
 - ▶ <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4235884>
- ▶ 2018 US Farm Bill - Sec.297A
- ▶ FDA Statement
 - ▶ <https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/warning-letters/curaleaf-inc-579289-07222019>

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How to Decipher a Certificate of Analysis

Questions?

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