

Test Certificate

Matrix: Tincture - Hemp Seed Oil Date Received: 12/21/2016

Certificate ID: 14538

Client Sample ID: CBD Oil

Attn: William Kleidon

This test method was performed in accordance with the requirements of ISO/IEC 17025. These results relate only to the test article listed in this report. Reports may not be reproduced except in their entirety.

Authorization: Christopher Hudalla, CSO	Signature:	Christophen Hudalla	Date: 12/29/2016
CN: Cannabinoid Profile & Potency [WI-1]	0-04]	Analyst: LA	Test Date: 12/22/2016

The client sample was analyzed by Convergence Chromatography (CC). The collected data was compared to data collected for certified reference standards at known concentrations.

14538-CN

-CN										
0.02 Δ9-THC TH	- 0.71 CV CBD	0.01 CBDV	0.01 CBG	0.03 CBC	CBN	0.03 THCA	CBDA	CBGA		
ID	V	Veight %		Conc.						
Δ9- THC	C	0.02 wt %		0.27 mg/	mL	_		1		
THCV		-		-						
CBD	C	.71 wt %	8.25 mg/mL				2000 214538			
CBDV	C	.01 wt %	0.13 mg/mL							
CBG	C	.01 wt %	0.12 mg/mL				SIL EXP.			
CBC	C	.03 wt %	0.32 mg/mL				CERT.			
CBN	C	.00 wt %	0.06 mg/mL							
THCA	C	.03 wt %	0.39 mg/mL							
CBDA	C	0.01 wt %		-		0.08 mg/mL				
CBGA	C	.01 wt %	0.09 mg/mL							
Total	().84 wt%	9.70 mg/mL							
Max THC	().05 wt%	0.61 mg/mL							
Max CBD	().72 wt%		8.32 mg/	mL					

Ratio of Total CBD to THC 14.4:1

Max THC (and Max CBD) are calculated values for total cannabinoids after heating, assuming complete decarboxylation of the acid to the neutral form. It is calculated based on the weight loss of the acid group during decarboxylation: Max THC = $(0.877 \times THCA) + THC$.

EA: Elemental Analysis [WI-10-13] Analyst:

Test Date: 12/29/2016

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14538-EA

Symbol	Metal	Conc. ¹	MDL	Limits ²
Al	Aluminum	28,020 ug/kg	5 ug/kg	-
As	Arsenic	63 ug/kg	4 ug/kg	200 ug/kg
Ba	Barium	1,362 ug/kg	0 ug/kg	-
Br	Bromine	59,265 ug/kg	5000 ug/kg	-
Cd	Cadmium	ND	1 ug/kg	200 ug/kg
Ca	Calcium	272,155 ug/kg	500 ug/kg	-
Cr	Chromium	208 ug/kg	5 ug/kg	-
Со	Cobalt	ND	10 ug/kg	-
Cu	Copper	ND	500 ug/kg	-
Ga	Gallium	ND	5000 ug/kg	-
Pb	Lead	17 ug/kg	2 ug/kg	500 ug/kg
Mg	Magnesium	279,810 ug/kg	500 ug/kg	-
Mn	Manganese	3,206 ug/kg	500 ug/kg	-
Hg	Mercury	6 ug/kg	2 ug/kg	100 ug/kg
Ni	Nickel	ND	500 ug/kg	-
K	Potassium	1,004,842 ug/kg	5 ug/kg	-
Se	Selenium	11 ug/kg	10 ug/kg	-
Na	Sodium	293,045 ug/kg	5 ug/kg	-
S	Sulfur	3,260 ug/kg	5 ug/kg	-
Sn	Tin	ND	5000 ug/kg	-
Zn	Zinc	1,570 ug/kg	5 ug/kg	-
Zr	Zirconium	130 ug/kg	0 ug/kg	-

1) ND = None detected to the Method Detection Limit (MDL)

2) MA Dept. of Public Health: Protocol for MMJ and MIPS, Exhibit 4(a) for all products.

PST: Pesticide Analysis [WI-10-11] Analyst: LA Test Date: 12/22/2016

The client sample was anlayzed for pesticides using Liquid Chromatography with Mass Spectrometric detection (LC/MS/MS). The method used for sample prep was based on the European method for pesticide analysis (EN 15662).

14538-PST						
Analyte	CAS	Result	Units	LLD	Limits (ppb)	Status
Abamectin	71751-41-2	ND	ppb	0.2	10	PASS
Acequinocyl	57960-19-7	ND	ppb	0.5	10	*
Bifenazate	149877-41-8	ND	ppb	0.01	10	PASS
Bifenthrin	82657-04-03	ND	ppb	0.11	10	PASS
Chlormequat chloride	999-81-5	ND	ppb	0.09	10	PASS
Cyfluthrin	68359-37-5	ND	ppb	0.5	10	*
Daminozide	1596-84-5	ND	ppb	10	10	*
Etoxazole	153233-91-1	ND	ppb	0.01	10	PASS
Fenoxycarb	72490-01-8	ND	ppb	0.07	10	PASS
Imazalil	35554-44-0	ND	ppb	0.03	10	PASS
Imidacloprid	138261-41-3	ND	ppb	0.06	10	PASS
Myclobutanil	88671-89-0	ND	ppb	0.03	10	PASS
Paclobutrazol	76738-62-0	ND	ppb	0.05	10	PASS
Pyrethrin	8003-34-7	ND	ppb	0.06	10	PASS
Spinosad	168316-95-8	ND	ppb	0.01	10	PASS
Spiromesifen	283594-90-1	ND	ppb	0.01	10	PASS
Spirotetramat	203313-25-1	ND	ppb	0.01	10	PASS
Trifloxystrobin	141517-21-7	ND	ppb	0.02	10	PASS

* Testing limits established by the Massachusetts Department of Public Health, Protocol for Sampling and Analysis of Finished Medical Marijuana Products and Marijuana-Infused Products for Massachusetts Registered Medical Marijuana Dispensaries, Exhibit 5. ND indicates "none detected" above the 10ppb threshold. Analytes marked with (*) indicate analytes for which no recovery was observed for a pre-spiked matrix sample.

TP: Terpenes Profile [WI-10-08]

Analyst: LabTech Test Date: 12/21/2016

The client sample was analyzed by Head-Space Gas Chromatography (HS-GC). The collected data was compared to data collected for certified reference standards at known concentrations.

14538-TP

Compound	ppm	Quantitative Profile	;	Compound	ppm	Quantitative Profile
Myrcene				Terpineol		
Pulegone				Camphene		
Isopulegol				Fenchone		
Borneol				B-pinene		
Menthol				Eucalyptol		
Nerolidol-cis				A-terpenine		
G-terpenine				3-carene		
Nerolidol-trans	9			A-pinene		
A-bisabolol	9			Citral-1		
Linalool				Citral-2		
Linalyl Acetate				Limonene		
B-caryophyllene	116			Citronellol		
Caryophyllene Oxide				Geraniol		
Eugenol				Ocimene-2		
Guaiol				Ocimene-1		
Sabinene				A-phellandrene		
Humulene	44			Terpinolene	4	
P-cymene						
pp Total Terpene: <0.	m 0.00 1 wt%	100.00	200.00		0.00	100.00 200.00

* Indicates qualitative calculation based on recorded peak areas.

VC: Analysis of Volatile Oranic Compounds [WI-10-07] Analyst: LabTech Test Date: 12/21/2016

The client sample was analyzed by Head-Space Gas Chromatography (HS-GC). The collected data was compared to data collected for certified reference standards at known concentrations.

14538-VC

Compound	CAS	Amount ¹	Limit ²	Status	
Heptane	142-82-5	22 ppm	5,000 ppm	PASS	
3-methylpentane	96-14-0	14 ppm	N/A	-	
Isopropanol	67-63-0	ND	5,000 ppm	PASS	
Acetone	67-64-1	6 ppm	5,000 ppm	PASS	
Ethanol	64-17-5	ND	5,000 ppm	PASS	
Methanol	67-56-1	43 ppm	3,000 ppm	PASS	

1) ND = None detected above 5 ppm.

2) In ppm, based on USP recommended limits for residual solvents, adopted by the Massachusetts Department of Public Health on 3/31/16. Butane/Propane limits are based on limits established for state of Colorado.

END OF REPORT