Hemp Quality Assurance Testing

CERTIFICATE OF ANALYSIS

DATE ISSUED 07/02/2024

SAMPLE NAME: Highnorth Ha-Ha Blast

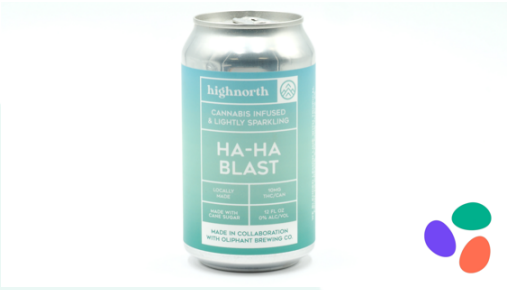
Infused, Hemp

CULTIVATOR / MANUFACTURER

Business Name:
License Number:
Address:

DISTRIBUTOR / TESTED FOR

Business Name: Oliphant Brewing LLC
License Number:
Address:
CA



SAMPLE DETAIL

Batch Number: 062424A
Sample ID: 240702K001

Date Collected: 07/02/2024
Date Received: 07/02/2024
Batch Size:
Sample Size: 1.0 units
Unit Mass: 377 milliliters per Unit
Serving Size:

Scan QR code to verify authenticity of results.

CANNABINOID ANALYSIS - SUMMARY

Total THC: 10.9707 mg/unit

Total CBD: Not Detected

Sum of Cannabinoids: 11.5362 mg/unit

Total Cannabinoids: 11.5362 mg/unit

Total THC/CBD is calculated using the following formulas to take into account the loss of a carboxyl group during the decarboxylation step:
Total THC = Δ^9-THC + (THCa (0.877))
Total CBD = CBD + (CBDa (0.877))
Sum of Cannabinoids = Δ^9-THC + THCa + CBD + CBDa + CBG + CBGa + THCV + THCVa + CBC + CBCa + CBDV + CBDVa + Δ^8-THC + CBL + CBN
Total Cannabinoids = (Δ^9-THC+0.877*THCa) + (CBD+0.877*CBDa) + (CBG+0.877*CBGa) + (THCV+0.877*THCVa) + (CBC+0.877*CBCa) + (CBDV+0.877*CBDVa) + Δ^8-THC + CBL + CBN

Density: 1.034 g/mL

LQC verified by: Yasmin Kakkar
Job Title: Senior Laboratory Analyst
Date: 07/02/2024

Approved by: Josh Wurzer
Job Title: Chief Compliance Officer
Date: 07/02/2024

References: limit of detection (LOD), limit of quantification (LOQ), not detected (ND), not tested (NT)

Cannabinoid Analysis

Tested by high-performance liquid chromatography with diode-array detection (HPLC-DAD).

Method: QSP 1157 - Analysis of Cannabinoids by HPLC-DAD

TOTAL THC: 10.9707 mg/unit
Total THC (Δ^9-THC+0.877*THCa)

TOTAL CBD: Not Detected
Total CBD (CBD+0.877*CBDa)

TOTAL CANNABINOIDS: 11.5362 mg/unit
Total Cannabinoids (Total THC) + (Total CBD) + (Total CBG) + (Total THCV) + (Total CBC) + (Total CBDV) + Δ^8-THC + CBL + CBN

TOTAL CBG: 0.2639 mg/unit
Total CBG (CBG+0.877*CBGa)

TOTAL THCV: ND
Total THCV (THCV+0.877*THCVa)

TOTAL CBC: ND
Total CBC (CBC+0.877*CBCa)

TOTAL CBDV: ND
Total CBDV (CBDV+0.877*CBDVa)

CANNABINOID TEST RESULTS - 07/02/2024

COMPOUND	LOD/LOQ (mg/mL)	MEASUREMENT UNCERTAINTY (mg/mL)	RESULT (mg/mL)	RESULT (%)
Δ^9-THC	*0.0001 / 0.0005*	*±0.00160*	**0.0291**	**0.00281**
CBN	*0.0001 / 0.0003*	*±0.00002*	**0.0008**	**0.00008**
CBG	*0.0001 / 0.0002*	*±0.00003*	**0.0007**	**0.00007**
Δ^8-THC	*0.0003 / 0.0008*	*N/A*	**ND**	**ND**
THCa	*0.0001 / 0.0002*	*N/A*	**ND**	**ND**
THCV	*0.0001 / 0.0005*	*N/A*	**ND**	**ND**
THCVa	*0.0001 / 0.0007*	*N/A*	**ND**	**ND**
CBD	*0.0001 / 0.0004*	*N/A*	**ND**	**ND**
CBDa	*0.0001 / 0.0010*	*N/A*	**ND**	**ND**
CBDV	*0.0001 / 0.0005*	*N/A*	**ND**	**ND**
CBDVa	*0.0001 / 0.0007*	*N/A*	**ND**	**ND**
CBGa	*0.0001 / 0.0003*	*N/A*	**ND**	**ND**
CBL	*0.0001 / 0.0004*	*N/A*	**ND**	**ND**
CBC	*0.0001 / 0.0004*	*N/A*	**ND**	**ND**
CBCa	*0.0001 / 0.0006*	*N/A*	**ND**	**ND**
SUM OF CANNABINOIDS			**0.0306 mg/mL**	**0.00296%**

Unit Mass: 377 milliliters per Unit

Δ^9-THC per Unit	**10.9707 mg/unit**
Total THC per Unit	**10.9707 mg/unit**
CBD per Unit	**ND**
Total CBD per Unit	**ND**
Sum of Cannabinoids per Unit	**11.5362 mg/unit**
Total Cannabinoids per Unit	**11.5362 mg/unit**

DENSITY TEST RESULT

1.034 g/mL

Tested 07/02/2024

Method: QSP 7870 - Sample Preparation

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CERTIFICATE OF ANALYSIS

Prepared for:
SUPERIOR MOLECULAR LLC
4459 WHITE BEAR PKWY
WHITE BEAR LAKE, MN USA 55110

Water Sol Full Panel May-July 2024 CBN,CBG,CBD,THC

Batch ID or Lot Number:	Test, Test ID and Methods:	Matrix:	Page 1 of 4
WS.FP.052824	Various	Finished Product	
Reported:	Started:	Received:	
31May2024	31May2024	29May2024	

Heavy Metals

Test ID: T000282343
Methods: TM19 (ICP-MS): Heavy Metals

	Dynamic Range (ppm)	**Result** (ppm)	**Notes**
Arsenic	0.05 - 4.77	ND	
Cadmium	0.05 - 4.88	ND	
Mercury	0.05 - 4.63	ND	
Lead	0.05 - 4.68	ND	

Final Approval


Karen Winternheimer
31May2024
01:01:00 PM MDT
PREPARED BY / DATE


Sam Smith
31May2024
01:03:00 PM MDT
APPROVED BY / DATE

Microbial Contaminants

Test ID: T000282342
Methods: TM25 (PCR) TM24, TM26, TM27 (Culture Plating)

	Method	**LOD**	**Quantitation Range**	**Result**	**Notes**
STEC	TM25: PCR	10^0 CFU/25g	NA	Absent	Free from visual mold, mildew, and foreign matter
Salmonella	TM25: PCR	10^0 CFU/25g	NA	Absent	
Total Yeast and Mold*	TM24: Culture Plating	10^1 CFU/g	$1.0x10^2$ - $1.5x10^4$	None Detected	
Total Aerobic Count*	TM26: Culture Plating	10^2 CFU/g	$1.0x10^3$ - $1.5x10^5$	None Detected	
Total Coliforms*	TM27: Culture Plating	10^1 CFU/g	$1.0x10^2$ - $1.5x10^4$	None Detected	

Final Approval


Brianne Maillot
02Jun2024
12:16:00 PM MDT
PREPARED BY / DATE


Brett Hudson
03Jun2024
05:30:00 PM MDT
APPROVED BY / DATE

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Residual Solvents

Test ID: T000282344
Methods: TM04 (GC-MS): Residual Solvents

	Dynamic Range (ppm)	**Result** (ppm)	**Notes**
Propane	92 - 1832	ND	
Butanes (Isobutane, n-Butane)	183 - 3653	ND	
Methanol	63 - 1265	ND	
Pentane	94 - 1888	ND	
Ethanol	100 - 1992	ND	
Acetone	107 - 2131	ND	
Isopropyl Alcohol	109 - 2186	ND	
Hexane	7 - 133	ND	
Ethyl Acetate	109 - 2178	ND	
Benzene	0.2 - 4.4	ND	
Heptanes	102 - 2040	ND	
Toluene	19 - 386	ND	
Xylenes (m,p,o-Xylenes)	134 - 2683	ND	

Final Approval

Karen Winternheimer
04Jun2024
10:29:00 AM MDT
PREPARED BY / DATE

Sam Smith
04Jun2024
10:33:00 AM MDT
APPROVED BY / DATE

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Pesticides

Test ID: T000282341
Methods: TM17

(LC-QQ LC MS/MS)	**Dynamic Range** (ppb)	**Result** (ppb)
Abamectin	338 - 2814	ND
Acephate	44 - 2726	ND
Acetamiprid	44 - 2712	ND
Azoxystrobin	42 - 2720	ND
Bifenazate	32 - 2734	ND
Boscalid	39 - 2750	ND
Carbaryl	42 - 2723	ND
Carbofuran	41 - 2710	ND
Chlorantraniliprole	34 - 2762	ND
Chlorpyrifos	44 - 2733	ND
Clofentezine	280 - 2749	ND
Diazinon	283 - 2720	ND
Dichlorvos	274 - 2739	ND
Dimethoate	43 - 2711	ND
E-Fenpyroximate	284 - 2616	ND
Etofenprox	38 - 2629	ND
Etoxazole	276 - 2541	ND
Fenoxycarb	12 - 2712	ND
Fipronil	50 - 2702	ND
Flonicamid	47 - 2755	ND
Fludioxonil	276 - 2757	ND
Hexythiazox	36 - 2651	ND
Imazalil	295 - 2769	ND
Imidacloprid	44 - 2776	ND
Kresoxim-methyl	30 - 2748	ND

	Dynamic Range (ppb)	**Result** (ppb)
Malathion	276 - 2737	ND
Metalaxyl	45 - 2745	ND
Methiocarb	40 - 2760	ND
Methomyl	44 - 2794	ND
MGK 264 1	175 - 1637	ND
MGK 264 2	133 - 1057	ND
Myclobutanil	40 - 2722	ND
Naled	43 - 2655	ND
Oxamyl	44 - 2765	ND
Paclobutrazol	42 - 2697	ND
Permethrin	277 - 2687	ND
Phosmet	33 - 2602	ND
Prophos	266 - 2795	ND
Propoxur	39 - 2723	ND
Pyridaben	280 - 2644	ND
Spinosad A	31 - 2078	ND
Spinosad D	68 - 637	ND
Spiromesifen	279 - 2620	ND
Spirotetramat	281 - 2789	ND
Spiroxamine 1	15 - 1013	ND
Spiroxamine 2	23 - 1623	ND
Tebuconazole	291 - 2722	ND
Thiacloprid	44 - 2756	ND
Thiamethoxam	44 - 2708	ND
Trifloxystrobin	42 - 2715	ND

Final Approval

Karen Winternheimer
10Jun2024
01:06:00 PM MDT
PREPARED BY / DATE

Sam Smith
10Jun2024
01:34:00 PM MDT
APPROVED BY / DATE

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Reported:	Started:	Received:	
31May2024	31May2024	29May2024	

https://results.botanacor.com/api/v1/coas/uuid/fe4b7038-aa0e-4e72-83c3-976fe389f70c

Definitions

LOD = Limit of Detection, ULOQ = Upper Limit of Quantitation, LLOQ = Lower Limit of Quantitation, PPB = Parts per Billion, % = % (w/w) = Percent (weight of analyte / weight of product). ND = None Detected (defined by dynamic range of the method). Total Potential Delta 9-THC or CBD is calculated to take into account the loss of a carboxyl group during decarboxylation step, using the following formulas: Total Potential Delta 9-THC = Delta 9-THC + (Delta 9-THCa *(0.877)) and Total CBD = CBD + (CBDa *(0.877)). Fail equates to a concentration level of Delta 9-THC, on a dry weight basis, higher than 0.3 percent + or – the measurement uncertainty. Total Potential THC is calculated using the following formulas to take into account the loss of a carboxyl group during decarboxylation step. Total THC = THC + (THCa *(0.877)). ALOQ = Above Limit Of Quantitation (defined by dynamic range of the method), CFU/g = Colony Forming Units per Gram. Values recorded in scientific notation, a common microbial practice of expressing numbers that are too large to be conveniently written in decimal form. Examples: 10^2 = 100 CFU, 10^3 = 1,000 CFU, 10^4 = 10,000 CFU, 10^5 = 100,000 CFU.

Cert #4329.02

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