

COMPREHENSIVE HOP PROFILE
CERTIFICATE OF ANALYSIS

Customer : Jim Mikesell - Dogstar Hops, LLC

Sample ID: Dogstar Crystal

Variety: Crystal

Certifying Officer: Zach Lilla - Lab Manager

Date : 9/16/2021

TTB Certified Chemist - Member AOAC - ASBC - BJCP



Method			
Hops-4C	Moisture Analysis	% Moisture	9.9
		% Dry Matter	90.1
AAR	Xanthohumol by HPLC	NT	mg/g
Hops-12	Hop Storage Index	HSI	0.232
Hops-13	Essential Oil by Steam Distillation	mL/100g	2.29
Hops-14	Alpha and Beta Acids by HPLC	Cohumulone	19.7 (% of Total AA)
ICE-3		% Alpha Acids	7.21
		Colupulone	33.4 (% of Total BA)
		% Beta Acids	7.91
		a/b ratio	0.91
Hops-17	Hop Essential Oil by GC-FID (as is)	% area	mg/100g
		B-Pinene	0.79 20.44
		Myrcene	62.87 1622.80
		Linalool	0.72 18.68
		Caryophyllene	5.42 139.76
		Farnesene	0.14 3.64
		Humulene	15.39 397.17
		Geraniol	0.36 9.39
NT=NOT TESTED		Total =	2211.88

Signed: _____

Zachary Lilla - Lab Manager - TTB Certified Chemist



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HOP QUALITY REPORT

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% Moisture	9.9	Typical Range 8 - 12%	✓
Total Oil ml/100g @ 10%	2.28	0.8 - 2.3 mL	✓
cohumulone	19.7	23 - 26%	↓
Alpha Acids @ 10%	7.20	3.0 - 6%	↑
Beta Acids @ 10%	7.90	6.0 - 8.5%	✓

AROMA QUALITY (AQ)

	% Area		
B-Pinene	0.79	0.40 - 1.00 %	✓
Myrcene	62.87	30.00 - 55.00 %	↑
Linalool	0.72	0.50 - 1.00 %	✓
Caryophyllene	5.42	5.00 - 12.00 %	✓
Farnesene	0.14	0.01 - 1.00 %	✓
Humulene	15.39	20.00 - 30.00 %	↓
Geraniol	0.36	0.30 - 0.80 %	✓
	mg/mL		
B-Pinene	8.94	4 - 10	✓
Myrcene	709.84	300 - 550	↑
Linalool	8.17	5 - 10	✓
Caryophyllene	61.13	50 - 120	✓
Farnesene	1.59	0.1 - 10	✓
Humulene	173.73	200 - 300	↓
Geraniol	4.11	3 - 8	✓
	mg/100g @ 10% Moisture		
B-Pinene	20.41	3.2 - 23	✓
Myrcene	1620.41	240 - 1265	↑
Linalool	18.65	4 - 23	✓
Caryophyllene	139.55	40 - 276	✓
Farnesene	3.63	0.08 - 23	✓
Humulene	396.58	160 - 690	✓
Geraniol	9.38	2.4 - 18.4	✓

Signed:

Zachary Lilla - Lab Manager - TTB Certified Chemist

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COMPREHENSIVE HOP PROFILE CERTIFICATE OF ANALYSIS



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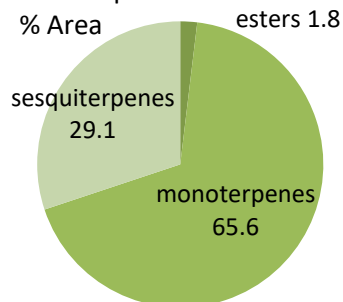


Date : 9/16/2021

Hops-17 Hop Essential Oil by GC-FID (Expanded Profile)
as a % of total oil

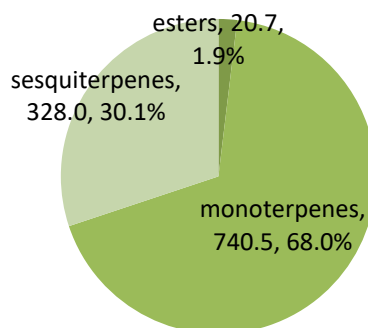
Oil Composition

% Area

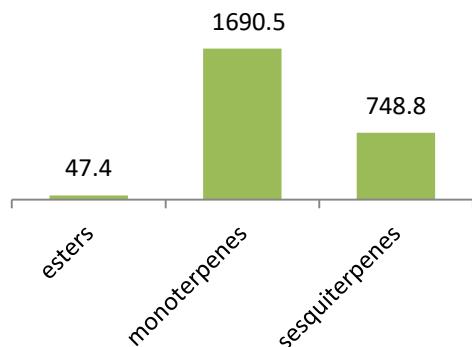


Oil Composition

mg/mL



mg/100g @ 10%



(10% moisture)

(as is)

	mg/100g	%Area	mg/100g
alpha pinene	3.70	0.14	3.71
isobutyl isobutyrate	0.33	0.01	0.33
beta pinene	20.41	0.79	20.44
myrcene	1620.41	62.87	1622.80
2-methylbutyl propanoate	2.22	0.09	2.23
limonene	5.16	0.20	5.17
2-methylbutyl 2-methylpropanoate	2.72	0.11	2.73
phellandrene	7.89	0.31	7.90
ocimene	4.69	0.18	4.70
2-methylbutyl 2-methylbutanoate	1.53	0.06	1.53
methyl heptanoate	5.26	0.20	5.27
2-methylbutyl 3-methylbutanoate	2.31	0.09	2.31
methyl 6-methylheptanoate	2.14	0.08	2.14
methyl octanoate	9.42	0.37	9.43
methanethiol caproate	0.82	0.03	0.82
perillen	0.18	0.01	0.19
methyl 6-methyloctanoate	2.45	0.10	2.46
ylangene	1.15	0.05	1.15
copaene	9.73	0.38	9.75
linalool	18.65	0.72	18.68
b-ylangene	2.30	0.09	2.30
caryophyllene	139.55	5.42	139.76
methyl-4-decanoate	18.17	0.71	18.19
farnesene	3.63	0.14	3.64
a humulene	396.58	15.39	397.17
y-murolene	39.18	1.52	39.23
b-selinene	57.62	2.24	57.70
a-selinene	56.17	2.18	56.26
cadinene	37.07	1.44	37.13
selina-3,7(11)-diene	4.60	0.18	4.60
elemene	1.18	0.05	1.18
geraniol	9.38	0.36	9.39

Total = 2490.28

Signed:

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