

HOP QUALITY REPORT CERTIFICATE OF ANALYSIS

To: Wisconsin Hop Exchange

Sample ID: 23EMS1087-01LH

Variety: Emerald Spire™

Product: T-90 Pellet

Date : 11/21/2023



Certifying Officer: Zach Lilla - Lab Manager
 TTB Certified Chemist - Member AOAC - ASBC - BJCP

<u>Method</u>			
Hops-4C	Moisture Analysis	% Moisture	11.8
		% Dry Matter	88.2
AAR	Xanthohumol by HPLC		NT mg/g
Hops-12	Hop Storage Index	HSI	0.270
Hops-13	Essential Oil by Steam Distillation	mL/100g	1.34
Hops-14	Alpha and Beta Acids by HPLC	Cohumulone	35.1 (% of Total AA)
ICE-3		% Alpha Acids	8.11
		Colupulone	61.8 (% of Total BA)
		% Beta Acids	4.49
		a/b ratio	1.81
Hops-17	Hop Essential Oil by GC-FID (as is)	% area	mg/100g
		B-Pinene	NT
		Myrcene	NT
		Linalool	NT
		Caryophyllene	NT
		Farnesene	NT
		Humulene	NT
		Geraniol	NT

NT=NOT TESTED

Signed:

Zachary Lilla - Lab Manager - TTB Certified Chemist
 AAR LAB - ADVANCED ANALYTICAL RESEARCH
 2517 Advance Rd Ste. A Madison WI 53718



AROMA QUALITY (AQ)

HOP QUALITY REPORT



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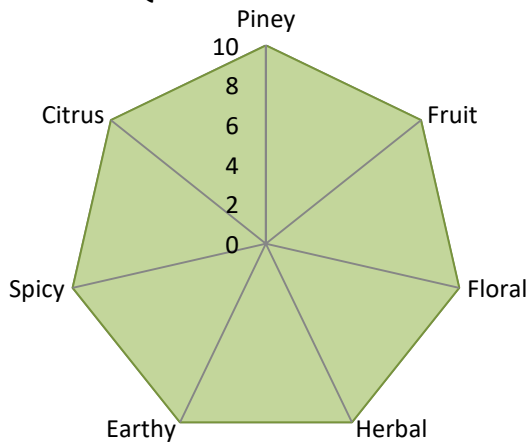
Certifying Officer: Zach Lilla - Lab Manager
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	Typical Range	
% Moisture <input style="width: 80px;" type="text" value="11.8"/>	8 - 12 %	<input checked="" type="checkbox"/>
HOP QUALITY (adjusted to 10% moisture)		
Total Oil ml/100g <input style="width: 80px;" type="text" value="1.37"/>	1.0 - 2.0 mL	<input checked="" type="checkbox"/>
cohumulone <input style="width: 80px;" type="text" value="35.1"/>	35 - 37%	<input checked="" type="checkbox"/>
Alpha Acids <input style="width: 80px;" type="text" value="8.28"/>	9.0 - 13%	<input type="checkbox" value="↓"/>
Beta Acids <input style="width: 80px;" type="text" value="4.59"/>	3.5 - 4.5%	<input type="checkbox" value="↑"/>
Myrcene <input style="width: 80px;" type="text" value="NT"/>	30.00 - 40.00 %	<input type="checkbox"/>

AROMA QUALITY (AQ)

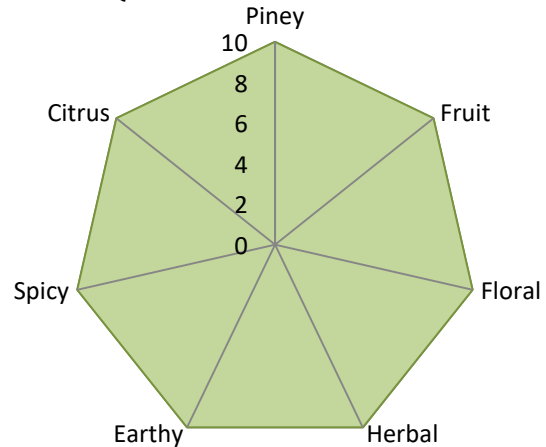
	% Area		mg/mL of Hop Oil		mg/100g of Hops (@10%H2O)	
	NT	Range	NT	Range	NT	Range
B-Pinene	NT	0.50 - 1.00 %	NT	5 - 10	NT	5 - 20
Myrcene	NT	30.00 - 40.00 %	NT	300 - 400	NT	300 - 800
Linalool	NT	0.70 - 1.20 %	NT	7 - 12	NT	7 - 24
Caryophyllene	NT	6.00 - 8.00 %	NT	60 - 80	NT	60 - 160
Farnesene	NT	0.01 - 1.00 %	NT	0.1 - 10	NT	0.1 - 20
Humulene	NT	9.00 - 12.00%	NT	90 - 120	NT	90 - 240
Geraniol	NT	0.20 - 1.00 %	NT	2 - 10	NT	2 - 20

AQ vs VARIETY SPECS



Aroma Intensity= 100

AQ vs ALL HOP VARIETIES



Aroma Intensity= 100

Signed: _____

Zachary Lilla - Lab Manager - TTB Certified Chemist

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