

## HOP QUALITY REPORT CERTIFICATE OF ANALYSIS

To: Wisconsin Hop Exchange

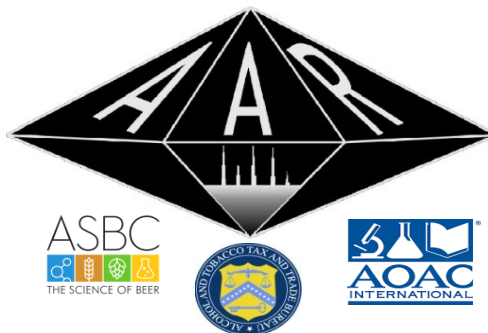
Sample ID: 23MIC1087-01LH

Variety: Michigan Copper™

T-90 Pellet

Date : 12/4/2023

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



Method

Hops-4C Moisture Analysis

% Moisture	9.2
% Dry Matter	90.8

AAR Xanthohumol by HPLC

NT	mg/g
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Hops-12 Hop Storage Index

HSI	0.268
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Hops-13 Essential Oil by Steam Distillation

mL/100g	1.83
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Hops-14 Alpha and Beta Acids by HPLC  
 ICE-3

Cohumulone	29.5	(% of Total AA)
<b>% Alpha Acids</b>	<b>11.05</b>	
Colupulone	54.5	(% of Total BA)
<b>% Beta Acids</b>	<b>3.28</b>	
a/b ratio	3.37	

Hops-17 Hop Essential Oil by GC-FID  
 (as is)

	% area	mg/100g
B-Pinene	NT	NT
Myrcene	NT	NT
Linalool	NT	NT
Caryophyllene	NT	NT
Farnesene	NT	NT
Humulene	NT	NT
Geraniol	NT	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



Customer : Wisconsin Hop Exchange

Sample ID: 23MIC1087-01LH

Variety: Michigan Copper™

Product: T-90 Pellet

Date : 12/4/2023



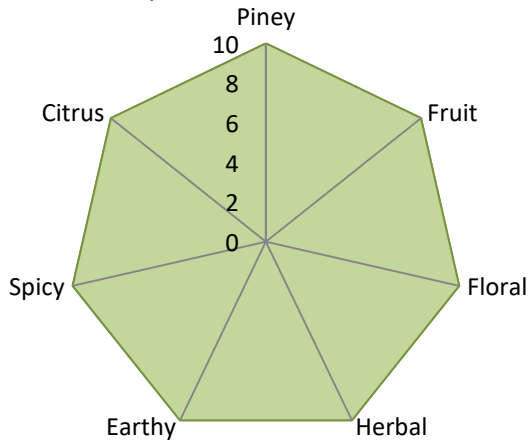
Certifying Officer: Zach Lilla - Lab Manager  
TTB Certified Chemist - Member AOAC - ASBC - BJCP

	Typical Range	
% Moisture <input style="width: 80px;" type="text" value="9.2"/>	8 - 12 %	<input checked="checked" style="width: 40px; height: 20px;" type="checkbox"/>
<b>HOP QUALITY (adjusted to 10% moisture)</b>		
Total Oil ml/100g <input style="width: 80px;" type="text" value="1.82"/>	1.2 - 1.8 ml	<input style="width: 40px; height: 20px;" type="checkbox" value="↑"/>
cohumulone <input style="width: 80px;" type="text" value="29.5"/>	27 - 32%	<input checked="checked" style="width: 40px; height: 20px;" type="checkbox"/>
Alpha Acids <input style="width: 80px;" type="text" value="10.95"/>	9.0 - 13%	<input checked="checked" style="width: 40px; height: 20px;" type="checkbox"/>
Beta Acids <input style="width: 80px;" type="text" value="3.25"/>	2.0 - 3.0%	<input style="width: 40px; height: 20px;" type="checkbox" value="↑"/>
Myrcene <input style="width: 80px;" type="text" value="NT"/>	28.00 - 38.00 %	<input style="width: 40px; height: 20px;" type="checkbox"/>

### AROMA QUALITY (AQ)

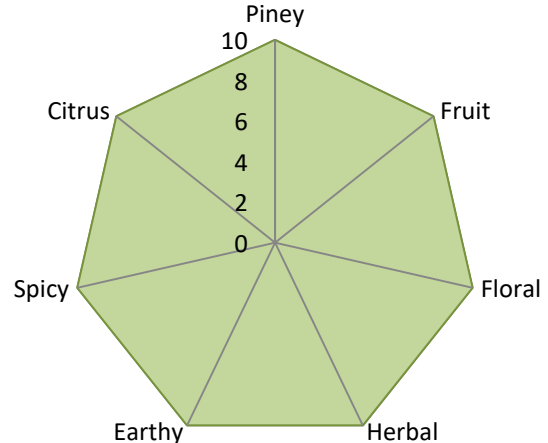
	% Area		mg/mL of Hop Oil		mg/100g of Hops (@10%H2O)	
	NT	Range	NT	Range	NT	Range
B-Pinene	NT	0.40 - 1.00 %	NT	4 - 10	NT	4.8 - 18
Myrcene	NT	28.00 - 38.00 %	NT	280 - 380	NT	336 - 684
Linalool	NT	0.6 - 1.20 %	NT	6 - 12	NT	7.2 - 21.6
Caryophyllene	NT	9.00 - 12.00 %	NT	90 - 120	NT	108 - 216
Farnesene	NT	0.01 - 1.00 %	NT	0.1 - 10	NT	0.12 - 18
Humulene	NT	17.00 - 23.00 %	NT	170 - 230	NT	204 - 414
Geraniol	NT	0.60 - 1.00 %	NT	6 - 10	NT	7.2 - 18

#### 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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