

**KAR Laboratories, Inc.
4425 Manchester Road
Kalamazoo, MI 49001**

Attn : Mr. William Rauch

**KAR Project No. : 610663
Date Reported : 08/16/16
Date Activated : 08/15/16
Date Due : 08/16/16
Date Validated : 08/16/16**

4425 Manchester Rd
Kalamazoo, MI 49001
Phone 269 381-9666
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Project

Description : Analysis of four samples of hops - example report.

Dear Client,

Your laboratory data is presented to you in this report. Unless otherwise stated under the "Comments" heading, all tests were performed within the maximum allowable holding times, have met or exceeded QC requirements and the result represents the sample as it was received.

If you wish to contact us about this work please mention KAR Project No. 610663. To arrange additional sampling or testing please contact our Client Services Department. If you have any questions regarding quality assurance please contact us.

You are the owner of this data and the laboratory cannot release the results to other parties. If a third party needs a copy of the laboratory report, it should come from you, the owner.

Thank you for the opportunity to serve you. Please do not hesitate to call if we can provide additional assistance.

Respectfully submitted,



David R. Alkema
Laboratory Manager

Results are invalid if report is not presented in its entirety. The laboratory does not own the data and cannot provide copies. The owner of this data is KAR Laboratories, Inc..

HOP TESTING LABORATORY REPORT

Client: **KAR Laboratories, Inc.**

KAR Project No. : **610663**

Date Reported: **08/16/16**

Analysis of four samples of hops - example report.

Sample ID : <u>"Chinook 2016"</u>						
Sampled By : WGR			Date Received: 08/15/16			
Sample Date : 08/15/16			Sample Type : Hops			
Sample Time : 1430			KAR Sample No. : 610663-01H			
Test	Result as received ("wet")	Units	Method used	Analyzed Date	By	Result expressed as 10% moisture ("dried")
Moisture	77.72	% by weight	Dried 145 deg. F	08/16/16	EIF	
Hops-14	See below			08/16/16	MHK	
Prep, hops (HPLC)	Completed		ASBC Hops-14	08/16/16	MHK	
Alpha acids	2.78	% by weight	ASBC Hops-14	08/16/16	MHK	11.2
Beta acids	0.78	% by weight	ASBC Hops-14	08/16/16	MHK	3.2
Cohumulone	31.5	% of Alpha acids	ASBC Hops-14	08/16/16	MHK	
Colupulone	56.8	% of Beta acids	ASBC Hops-14	08/16/16	MHK	

Sample ID : <u>"Willamette 2016"</u>						
Sampled By : WGR			Date Received: 08/15/16			
Sample Date : 08/15/16			Sample Type : Hops			
Sample Time : 1430			KAR Sample No. : 610663-02H			
Test	Result as received ("wet")	Units	Method used	Analyzed Date	By	Result expressed as 10% moisture ("dried")
Moisture	79.54	% by weight	Dried 145 deg. F	08/16/16	EIF	
Hops-14	See below			08/16/16	MHK	
Prep, hops (HPLC)	Completed		ASBC Hops-14	08/16/16	MHK	
Alpha acids	1.02	% by weight	ASBC Hops-14	08/16/16	MHK	4.5
Beta acids	0.83	% by weight	ASBC Hops-14	08/16/16	MHK	3.7
Cohumulone	32.7	% of Alpha acids	ASBC Hops-14	08/16/16	MHK	
Colupulone	53.0	% of Beta acids	ASBC Hops-14	08/16/16	MHK	

Sample ID : <u>"Nugget 2016"</u>						
Sampled By : WGR			Date Received: 08/15/16			
Sample Date : 08/15/16			Sample Type : Hops			
Sample Time : 1430			KAR Sample No. : 610663-03H			
Test	Result as received ("wet")	Units	Method used	Analyzed Date	By	Result expressed as 10% moisture ("dried")
Moisture	79.72	% by weight	Dried 145 deg. F	08/16/16	EIF	
Hops-14	See below			08/16/16	MHK	
Prep, hops (HPLC)	Completed		ASBC Hops-14	08/16/16	MHK	
Alpha acids	1.48	% by weight	ASBC Hops-14	08/16/16	MHK	6.6
Beta acids	1.08	% by weight	ASBC Hops-14	08/16/16	MHK	4.8
Cohumulone	42.6	% of Alpha acids	ASBC Hops-14	08/16/16	MHK	
Colupulone	68.3	% of Beta acids	ASBC Hops-14	08/16/16	MHK	

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KAR Laboratories, Inc.

HOP TESTING LABORATORY REPORT

Client: *KAR Laboratories, Inc.*

KAR Project No. : **610663**

Date Reported: **08/16/16**

Analysis of four samples of hops - example report.

Sample ID : <u>"Cascade 2016"</u>		Date Received: 08/15/16	
Sampled By : WGR		Sample Type : Hops	
Sample Date : 08/15/16		KAR Sample No. : 610663-04H	
Sample Time : 1430			

Test	Result as received ("wet")	Units	Method used	Analyzed Date	By	Result expressed as 10% moisture ("dried")
Moisture	80.64	% by weight	Dried 145 deg. F	08/16/16	EIF	
Hops-14	See below			08/16/16	MHK	
Prep. hops (HPLC)	Completed		ASBC Hops-14	08/16/16	MHK	
Alpha acids	1.03	% by weight	ASBC Hops-14	08/16/16	MHK	4.8
Beta acids	1.02	% by weight	ASBC Hops-14	08/16/16	MHK	4.7
Cohumulone	33.2	% of Alpha acids	ASBC Hops-14	08/16/16	MHK	
Colupulone	51.0	% of Beta acids	ASBC Hops-14	08/16/16	MHK	

Column

Explanation

Test	The property or component we tested for in your sample
Result as received ("wet")	The actual findings of the Test on the sample as it was received at the laboratory
Units	The unit of measure that the Result is expressed in
Method used	The analytical test procedure the laboratory used to measure the Test
Analyzed	The date the test was performed and the initials of the analyst that performed that Test
Results expressed as 10% moisture ("dried")	Some users prefer results to be normalized to 10% moisture. The following formula is used for that purpose, and the number in this column represents that number: Result as received x (90 / (100 - %Moisture)) . Very rarely, this column may also contain a narrative of any testing issues or problems encountered.

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