YCHHOPS

YAKIMA CHIEF - HOPUNION LLC

CERTIFICATE OF ANALYSIS

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Supplier: **Yakima Chief-Hopunion, LLC**
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Date of Issue: 15-Nov-2017

Product Name: **Type 90 Hop Pellets**

Lot Number: P91-ZKUWIL0212
Variety: Willamette
Crop Year: 2016

Characteristic	Typical Analysis	Actual Analysis
Alpha Acids:	2.5 - 17.5% (w/w) UV Spectro by ASBC HOPS - 6A	4.7%
Beta Acids:	3.0 - 9.0% (w/w) UV Spectro by ASBC HOPS - 6A	3.7%
Hop Storage Index	Varies by Variety and Time from Harvest Hop Storage Index by ASBC Hops - 12	0.276
Oil by Distillation:	Varies by Variety ASBC Hops - 13 (%v/w)	0.8%

Oil Profile by GC, EBC Analytica V 7.12:

B-Pinene:	0.4 %	**Farnesene:**	7.3 %
Myrcene:	25.9 %	**Humulene:**	35.2 %
Linalool:	0.5 %	**Geraniol:**	0.1 %
Caryophyllene:	13.4 %		

Lead:	< 1.0 ppm	passes test
Arsenic:	< 0.5 ppm	passes test
Cadmium:	< 0.03 ppm	passes test
Total Heavy Metals:	< 10 ppm (asPb)	passes test

Missy Raver

Missy Raver
Quality Control Manager