

PRODUCT DATA SHEET

Fresh Hops



PACKAGED BY

Yakima Chief - Hopunion
203 Division Street, Yakima, WA 98902 USA
P 509.453.4792 // F 509.453.1551

DESCRIPTION

Fresh hops are the most unpredictable, yet exciting form of hops available. They are harvested fresh as whole, wet cones at the farm, and are shipped to customers for immediate brewing within 36 hours of harvest. Their unadulterated state creates a host of logistical challenges, but endows each harvest with an enticing flavor profile that can only be enjoyed once per year. For brewers and consumers alike, the vibrant flavors found in fresh hop beers are a simple reminder of, and tribute to, beer's agricultural roots. Yakima Chief - Hopunion's fresh hops program occurs once per year with delivery during harvest. We offer brewers a selection of six different varieties. Informational summaries for these hop varieties are available at ychhops.com.

ALTERNATE PRODUCT NAMES

Fresh hops are also known as wet hops.

APPLICATION

Fresh hops are primarily used in late kettle additions or dry hopping to provide bitterness and a fresh, hop character to beer.

ADDITION PROCEDURE

Add the fresh hops as late additions or in post-fermentation for best utilization of the fresh hop aroma and flavor character. Fresh hops can be added to the brew loose, in mesh bags or added via custom designed dosing systems.

USE RATE CALCULATIONS

Addition during early kettle boil to achieve average bitterness in high gravity wort/beer will typically lead to the extraction and isomerization of about 25% of the alpha acids in the finished beer. Addition rate is thus calculated as follows:

$$\text{kgA} = \text{BU} \times \text{HL} / 2500$$

Where: kgA = kg of alpha acids to add in the brew kettle

BU = the desired amount of bitterness units in the finished beer

HL = hectoliters of finished beer (1 barrel = 1.173477657999771 hectoliter)

Use rates may vary depending on the brewing process and the desired hopping level

Addition during kettle boil to provide bitterness and/or aroma will be dependent on the time of the addition and the desired hop character in the finished beer. Hop formulation and addition rates will be determined on a case-by-case basis. Also, additional rates during or post-fermentation to reinforce aroma in beer will be determined on a case-by-case basis.

(Depending on preference, the usage ratio for fresh hops to dry hops can vary from 3:1 to 6:1.)

AROMA

Fresh hop aromas are the most distinct of any hop form. They vary from year to year and are predominantly described as fresh and grassy. The undadulterated characteristic of these hops is enticing for craft consumers, but can prove to be a challenge for brewers when compared to more traditional forms of hops of the same variety. Aroma descriptors include, but are not limited to citrus, tropical fruit, stone fruit, pine, cedar, floral, spicy, herbal, earthy, tobacco, onion/garlic and grassy.

PACKAGING

Fresh hops are shipped in 10 lb boxes (20" x 12" x 18", 50.8cm x 30.5cm x 45.7cm) using UPS Next Day services. Shipments are susceptible to small fluctuations in weight due to water loss from evaporation.

STORAGE

Fresh hops should be used immediately upon receipt. Due to high moisture content and the risk of mold, Fresh hops should not be stored.

SPECIFICATION SHEET

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	METHOD	TYPICAL ANALYSIS
ALPHA ACIDS ASSAY*	UV Spectro. by ASBC HOPS-6A	3.0 - 15.5% (w/w)
BETA ACIDS ASSAY*	UV Spectro. by ASBC HOPS-6A	3.0 - 5.5% (w/w)
HOP STORAGE INDEX	ASBC HOPS-12	Varies by variety & time from harvest
LEAD		< 1.0 ppm
ARSENIC		< 0.5 ppm
CADMIUM		< 0.03 ppm
TOTAL HEAVY METALS (as Pb eq.)		< 10 ppm
PESTICIDES	US regulations and EC Dir. 90/642/EEC w/ amendments	

* NOTE: Concentration determined on a dry basis and is dependent upon variety of hops and crop year

SAFETY DATA SHEET
Fresh Hops

1. PRODUCT IDENTIFICATION

1.1 Product Name	Fresh Hops (wet hop cones, fresh hop cones) Whole, wet (non-dried) hop cones without leaf and stem
1.2 Supplier	Yakima Chief - Hopunion, LLC 203 Division St. Yakima, WA 98902 (USA) Tel.: 800 952 4873 555 West South Hill Road PO Box 209 Sunnyside, WA 98944 (USA) Tel.: (509) 839-9022
1.3 Emergency Contact	Yakima Chief - Hopunion, LLC 203 Division St. Yakima, WA 98902 (USA) Tel.: 800 952 4873 Website: ychhops.com
1.4 Recommended Use	Ingredient used in brewing beer
1.5 Restrictions on Use	None

2. HAZARD IDENTIFICATION

2.1 Hazard Classification	Not applicable; product is natural, unrefined and contains no additives
2.2 Label Elements	Not applicable
2.3 Other Hazards	Dust may be a mild irritant to the eyes Prolonged skin contact could cause dermatitis in some individuals Dust generated during sweeping of spilled product may cause severe respiratory distress in some individuals

3. COMPOSITION, INGREDIENT INFORMATION

3.1 Composition	Whole, wet (non-dried) hop cones without leaf and stem
3.2 Hazard Components	Not applicable; product is natural, unrefined and contains no additives

4. FIRST AID MEASURES

4.1 Oral Ingestion	Not applicable
4.2 Eye Contact	Wash with copious amounts of water Seek medical attention if irritation persists
4.3 Skin Contact	Wash with warm, soapy water Seek medical attention if irritation persists Launder contaminated clothing before reuse
4.4 Inhalation	Move affected person to fresh air Administer oxygen if necessary
4.5 Symptoms	None known

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media	Water, CO ₂
5.2 Hazards from Fire	None known

6. ACCIDENTAL RELEASE MEASURES

6.1 Procedure	Scoop/shovel spilled material into recovery container Flush area with hot, soapy water to remove final traces
6.2 Protective Equipment	Use adequate ventilation or a respirator if in a confined area Use rubber gloves Wear safety glasses

7. HANDLING AND STORAGE

7.1 Handling Equipment	Product is shipped in ventilated, cardboard boxes (20"x12"x18") and can be handled directly, loose, or transferred to mesh bags of food grade quality. All handling should be conducted in ventilated containers
7.2 Precautions	Avoid prolonged skin contact Use personal protective equipment (Section 8) Avoid prolonged storage as product can combust when hot and wet
7.3 Storage Conditions	Due to high moisture content and risk of mold, Fresh Hops should not be stored for periods of time exceeding 12-24 hours

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 Permissible Exposure Limits (PELs)	Not applicable
8.2 Threshold Limit Values (TLVs)	Not applicable
8.3 Engineering Controls	Provide adequate ventilation
8.4 Personal Protective Equipment (PPE)	Skin Protection: wear rubber gloves if prolonged exposure Eye Protection: wear safety glasses Respiratory Protection: wear facemask if dust will be generated

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance	Green, whole hop cones
9.2 Odor	Pungent, herbal, and/or grassy aroma
9.3 Odor Threshold	No data available
9.4 pH	No data available
9.5 Freezing Point	No data available
9.6 Boiling Point	No data available
9.7 Flash Point	No data available
9.8 Evaporation Rate	Not applicable; solid
9.9 Flammability	No data available
9.10 Upper/Lower Flammability	No data available
9.11 Vapor Pressure	Not applicable; solid
9.12 Vapor Density	Not applicable; solid
9.13 Density	Varies with production parameters
9.14 Solubility in Water	Insoluble
9.15 Partition Coefficient	No data available
9.16 Auto-ignition Temperature	No data available
9.17 Decomposition Temperature	No data available
9.18 Viscosity	Not applicable; solid

10. STABILITY AND REACTIVITY

10.1 Reactivity	Product is sensitive to oxidation and drying in open containers, and/or under excessive temperatures
10.2 Stability	Product is stable under appropriate storage conditions (Section 7.3)
10.3 Possibility of Hazardous Reactions	None known
10.4 Conditions to Avoid	See Section 7.3
10.5 Incompatible Materials	None known
10.6 Hazardous Decomposition Products	None known

11. TOXICOLOGICAL INFORMATION

11.1 Acute Toxicity	None known; product is "Generally Recognized As Safe" (GRAS 21 CFR 182.20)
11.2 Routes of Exposure	Inhalation: No data available Ingestion: No data available Skin contact: No data available Eye contact: No data available
11.3 National Toxicology Program	Not listed on report of carcinogens

12. ECOLOGICAL INFORMATION

12.1 Toxicity	No data available
12.2 Potential for Persistence and Degradation	No data available; product is all-natural and biodegradable
12.3 Bioaccumulation	No data available; product is all-natural
12.4 Mobility in Soil	No data available
12.5 Other Effects	No data available

13. DISPOSAL CONSIDERATIONS

13.1 Product Disposal	According to regulations in force
13.2 Packaging Disposal	According to regulations in force; for paper/cardboard, steel and PET

14. TRANSPORTATION INFORMATION

14.1 UN Number	Non-hazardous product
14.2 Shipping Name	Fresh Hops
14.3 Hazard Class	Non-hazardous product
14.4 Packing Group	Non-hazardous product
14.5 Environmental Hazards	Non-hazardous product
14.6 Other	Product is not classified as ADR and should not be transported along with ADR classified cargo Product should be stored away from engines or any heat source during transportation

15. REGULATORY INFORMATION

15.1 Regulations	Food safe Heavy metals, pesticides/herbicides/fungicides, nitrates, radioactivity: Below tolerance levels. Allergenic-free, non GMO, traceable
15.2 REACH	Not applicable (No EINECS Ref.)

16. OTHER INFORMATION

16.1 Issue Date	26 May 2015
16.2 Revision Date	
16.3 Other	