YAKIMA CHIEF HOPS®

AMERICAN NOBLE HOPS™

PRODUCT DATA SHEET

AMERICAN NOBLE HOPS SUBTLE

nqa. ISO 9001 ISO 14001 Registered

PACKAGED BY

Yakima Chief Hops
306 Division Street, Yakima, WA 98902 USA
Phone (509) 457-3200

DESCRIPTION

American Noble Hops™ is produced from whole leaf hops using Yakima Chief Hops' proprietary cryogenic separation process that preserves all components of each fraction. American Noble Hops™ is the leafy part of the hop cone (bract and strig) which has had most of the lupulin removed resulting in a "de-bittered" hop. It is a high quality, low alpha alternative to provide noble character to beer. Analytically, American Noble Hops™ appears similar in character to noble hops but may be derived from higher resin Northwest varieties such as Simcoe® Brand, Mosaic® Brand and Cascade. American Noble Hops™ may be used anywhere pellets may be used in any style but particularly in Pilsner, Kölsch, Blonde, and sour styles including Gose, Gueuze, and Berliner Weisse.

PACKAGING & STORAGE

American Noble Hops™ is packaged inside polyethylene pouches and/or metallic polyester foils ranging from 11lb (5kg) to 44lb (20kg) capacities and shipped in cardboard cartons. Packaging is done with a nitrogen flush under inert atmosphere. American Noble Hops™ is packaged based on kg net weight or kg alpha acids. A complete list of packaging information can be obtained upon request. American Noble Hops™ should be stored near-freezing, preferably between 30°F and 41°F (-1°C and 5°C). They will remain stable in closed containers under the following conditions: 3 years in nitrogen flushed, vacuum sealed packaging. Storage stability does vary per variety and can be negatively affected by exposure to oxygen, heat and/or light

APPLICATION & USAGE

American Noble Hops™ may be used anywhere pellet hops can be used. It is best used for kettle additions where it can be separated in the whirlpool trub. When formulating recipes the alpha content of the lot should be used to calculate bittering as would be done for whole leaf or pellet hops:
kg product = IBU / 30 x hl / Alpha%
Where: IBU = international bitterness unit desired, hl = is hector liters of finished beer (1 barrel = 1.173 hectoliter), Alpha % = equals alpha %w/w content from CofA as a whole number. Use rates may vary depending on the brewing process and the desired hopping level.

American Noble Hops™ is best used in beer styles with mild bitterness and pleasant but not dominant hop flavors and aromas. Because of the low alpha content American Noble Hops™ is a good choice for sour beer production because it will have a minimal effect on lactic acid bacteria while contributing polyphenols and glycosides typical of low alpha hops. Some brewers have found success using American Noble Hops™ in the mash to aid runoff and contribute antioxidants on the theory they will limit mash oxidation.

BENEFITS

American Noble Hops™ enables a brewer to use classic US aroma varieties in beer styles which typically are brewed with noble hops. American Noble Hops™ resembles a noble hop in alpha content but the bract itself still contains many other aromatic and brewing characteristics of the variety. When used, American Noble Hops™ contributes pleasant noble bitterness and many aspects of the whole cone's aroma thanks to extraction of water soluble flavor compounds like glycosides and polyphenols.

- Noble hop replacement with reliable supply
- High quality low alpha hop product
- Unique flavor profiles from high resin hops
- Source of polyphenols and antioxidants
- Low cost

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SPECIFICATION SHEET

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DESCRIPTION	METHOD	TYPICAL ANALYSIS
Alpha Acids*	UV Spectro. by ASBC HOPS-6A	0.5 - 6.0% (w/w)
Beta Acids*	UV Spectro. by ASBC HOPS-6A	0.5 - 2.0% (w/w)
Hop Storage Index	ASBC HOPS-12	Varies by variety & time from harvest
Lead		< 0.6 ppm
Arsenic		< 0.4 ppm
Cadmium		< 0.1 ppm
Mercury		< 0.05 ppm
Total Heavy Metals (as Pb eq.)		< 10 ppm
Pesticides	Comply with US Regulations & EC Directive 396/2005 Amendments	

** NOTE: Concentration dependent upon variety of hops and crop year*

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SAFETY DATA SHEET

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1. PRODUCT IDENTIFICATION

1.1 Product Name	American Noble Hops™ (Bract of hop cones) Made from dried and ground hop cones
1.2 Supplier	Yakima Chief Hops Inc. 306 Division St. Yakima, WA 98902 (USA) Phone: +1.509.457.3200 Email: quality@yakimachief.com Website: yakimachief.com
1.3 Recommended Use	Ingredient used in brewing beer.
1.4 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	A course powder or pellets composed of ground hops, produced by milling and sieving, dried, hop cones.
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	Remove affected person to fresh air. Administer oxygen if necessary.
4.5 Symptoms	None Known

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media	Water, CO2
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	Closed Container of Food Grade Quality. Stainless Steel, Lacquered Steel, Laminated Aluminum Foils or PET Pouches.
7.2 Precautions	Avoid generating excessive dust and prolonged skin contact. Use personal protective equipment (Section 8)
7.3 Storage Conditions	Store in dry, odor free environment at temperature range of -3°C to 5°C (25°F to 41°F). Prolonged exposure to high temperatures may cause foils to burst and reduced quality.

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 face mask if dust will be generated

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance & Odor	Yellow, green or brown powder.
9.2 Odor	Hoppy, depends on variety
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 Point	No data available; Solid
9.9 Flammability	No data available
9.10 Upper/Lower Flammability	No data available
9.11 Vapor Pressure	No data available; Solid
9.12 Vapor Density	No data available; 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 in open containers in absence of inert atmosphere an/or under excessive temperatures
10.2 Stability	Product is stable under appropriate storage conditions, in closed containers and/or under inert atmosphere. (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 Toxicology	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	Milled Bract
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 Safety Data Sheet Issue Date	2015-11Nov-10
16.2 Safety Data Sheet Revision Date	2025-12Dec-08
16.3 Safety Data Sheet Other	Safety Data Sheet reviewed 2025-12Dec-08