

PRODUCT DATA SHEET

Hexa

PRODUCED BY

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

DESCRIPTION

Hexa is a translucent, pale-yellow aqueous solution of the potassium salts of hop derived hexahydroiso-*alpha*-acids and tetrahydroiso-*alpha*-acids in a 50:50 blend. Hexa is derived from CO₂ hop extract and is standardized at 10% w/w by HPLC analysis.

COMMON APPLICATIONS

Hexa can be utilized in the following ways:

- As 100% of the hop bill or in conjunction with other light stable hop extracts (i.e. Rho, Hop Aroma) for the *hopping of light stable beers*
Hexa is stable to UV light and will not develop sun-struck flavors.
- As part of hop formulation to *enhance foam stand and cling*
Even at relatively low concentrations of 2-5 ppm, foam stand and lacing are significantly enhanced while maintaining the beer's characteristic flavor.
- As a *unique brewing ingredient to replace foam additives*
- As part of hop formulation to *improve long term flavor stability*
- As part of hop formulation to *differentiate beers*
Bitterness intensity is 1.3 times the bitterness per BU when compared to iso-alpha acids. The bitterness profile is sharper and more intense than iso-alpha acids. This will be perceived at concentrations of 5 ppm and higher, depending on beer style.

USE RATE CALCULATIONS

To calculate grams per hectoliter based on 70% utilization and 1.3 times the bitterness of iso-alpha acid:

$$gH = BU \times 1.10g / HL$$

Where: gH = grams of Hexa

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 point of addition and the hopping level.

DOSING METHODS

YCH HOPS recommends the direct, undiluted injection of Hexa into the beer stream. If an appropriate pump is not available, Hexa can be diluted with de-ionized water. The dilution factor will be determined according to the available dosing installation. Buffering agents are not required if the solution is dosed within six hours of preparation. In any case, Hexa should be added to beer after fermentation and primary filtration, at a point where there is good mixing and ideally before a final filtration step. Proportioning Hexa over at least 75% of the filtration time is recommended. Hexa injections should be made with a positive displacement pumping system; CO₂ back pressure should not be used. A 2-3 mm in diameter dip tube positioned in the middle of, and oriented against, the beer stream will provide excellent dispersion.

YIELD

Yield can be dramatically affected by the presence of the following:

- Adsorbent factors such as yeast, kieselguhr, silica gel, PVPP
- pH reduction such as CO₂, sugar, syrups

CHARACTERISTICS

- Flavor of a solution in de-ionized water containing 10 mg/L of Hexahydroiso-*alpha* acids: a fine bitterness with no other detectable flavors
- Aroma of a solution in de-ionized water containing 10 mg/L of Hexahydroiso-*alpha* acids: no detectable aromas
- Gushing potential in beer: no increased potential when dosed below 5 ppm

PACKAGING

- 20 kg deltangular tight head PET containers
- Two layers of 16 drums per pallet (640 kg)

STORAGE

- Hexa should be stored at room temperature between 59 - 77°F (15 - 25°C). Under these conditions Hexa will remain stable in a closed container for 18 months.
- A deposit may form on prolonged storage at lower temperatures. This deposit will re-dissolve at 77°F (25°C) in a water bath with mixing.
- Opened containers should be used within one month when stored at room temperature.

SPECIFICATION SHEET

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HOP ACIDS ASSAY	METHOD	TYPICAL ANALYSIS
Hexahydroiso-alpha-acids (HHIAA) and Tetrahydroiso-alpha-acids (THIAA)	HPLC by EBC 7.9 ICS-T2 and ICS-H1 Std.	10.0% +/- 0.3% (w/w) 50:50 mixture +/- 5
Iso-alpha-acids (IAA)	EBC 7.9 (ICS-I3 Std.)	< 0.1% (w/w)

	METHOD	TYPICAL ANALYSIS
Area Purity	THIAA and HHIAA Peak Area as % of Total Area HPLC by EBC 7.9	> 85%
pH		> 9.0
Haze of 1.0% Solution	Haze Units, EBC 9.16	< 0.5
Specific Gravity		1.02 +/- 0.01
Lead		< 1.0 ppm
Arsenic		< 0.5 ppm
Cadmium		< 0.03 ppm
Total Heavy Metals (as Pb eq.)		< 10 ppm

* NOTE: Concentration dependent upon hop variety and crop year

SAFETY DATA SHEET

Hexa

1. PRODUCT IDENTIFICATION

1.1 Product Name	Hexa (Hexa 10%, aqueous Hexa/Tetra blend, 50:50 blend of potassium salts of hexahydroiso-alpha-acids and tetrahydroiso-alpha-acids) Made from CO ₂ hop extract
1.2 Supplier	Yakima Chief - Hopunion, LLC 203 Division Street 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 Street 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
2.2 Label Elements	Not applicable
2.3 Other Hazards	Prolonged skin contact could cause dermatitis in some individuals

3. COMPOSITION, INGREDIENT INFORMATION

3.1 Composition	An aqueous solution the potassium salts of the hexahydroiso-alpha-acids and tetrahydroiso-alpha-acids in a 50:50 blend produced by isomerizing, hydrogenating, and reduction of the alpha-acids from CO ₂ hop extract.
3.2 Hazard Components	Not applicable Product is natural

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	Dry powder, foam, 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	Closed container of food grade quality Stainless steel, lacquered steel or PET
7.2 Precautions	Avoid prolonged skin contact, use personal protective equipment (Section 8)
7.3 Storage Conditions	Store in unopened container at 37.4 - 77°F (3 - 25°C)

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance	Translucent pale-yellow
9.2 Odor	Slight resinous odor
9.3 Odor Threshold	No data available
9.4 pH	9 - 11
9.5 Freezing Point	< 32°F (0°C)
9.6 Boiling Point	> 212°F (100°C)
9.7 Flash Point	Not applicable
9.8 Evaporation Rate	< 1
9.9 Flammability	No data available
9.10 Upper/Lower Flammability	No data available
9.11 Vapor Pressure	No data available
9.12 Vapor Density	No data available
9.13 Density	1.02 +/-0.01
9.14 Solubility in Water	Complete at pH 10
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	No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity	Product is sensitive to oxidation in open containers and/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 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	Hexa
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	