YCHHOPS

nqa. ISO 9001 ISO 14001 Registered

PRODUCT DATA SHEET

IKE

PRODUCED BY

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

DESCRIPTION

IKE is a pure resin extract of hops containing hop oils, beta acids and iso-alpha acids. It is made from pure resin CO_2 Hop Extract, in which alpha acids have been converted into iso-alpha acids in their free acid form, in a way that it preserves the vital hop compounds. YCH's isomerization process concentrates the soft resin portion of hop extract to deliver clean bitterness and hop aroma. Isomerization parameters are defined to best protect aroma, flavor and bittering characteristics. IKE is virtually free of Nitrates and polyphenols.

Typical analysis of the product: 35-65% iso-alpha acids, 10-30% beta acids, and <2% alpha acids.

IKE can be made from any available hop variety. Detailed technical data sheets for these hop varieties are available at www.ychhops.com.

Fresh hop aroma and flavor characteristics will not change after extended periods of storage.

APPLICATIONS

IKE is primarily used as kettle hop ingredient to provide "clean" bitterness and hop character to beer. Also, it will improve physical stability and will contribute to a more consistent beer.

Traditionally, kettle hopping with extract will also lead to improved trub formation and improved antimicrobial and antifoaming properties.

ADDITION PROCEDURE

Add the IKE in wort early during kettle boil for bitterness and late during kettle boil for bitterness and aroma. IKE packaged in bulk drums has to be heated up to 122 - 140°F (50 - 60°C) for some hours to be melted prior to injecting it into the brew kettle. Heating temperature and time may depend on hop variety and addition rate will depend on the alpha concentration in the extract. IKE is considered as a thicksotropic product and stirring at room temperature should alternatively homogenize the product and reduce viscosity to a level allowing pouring of the resin. IKE packaged in custom tins can be directly flushed with hot wort in the brew kettle or in specific by-pass dosing systems.

USE RATE CALCULATIONS

Addition during early kettle boil to achieve average bitterness in high gravity wort/beer will typically lead to the utilization of 65% (by HPLC) of the iso-alpha acids in the finished beer. Addition rate is thus calculated as follows:

$$kgIAA = \frac{BU \times Hl}{6500}$$

Where: kgIAA = kg of iso-alpha acids to add in the brew kettle
BU = is the desired amount of bitter units in the finished beer*
Hl = Hl of finished beer

Use rates may vary from 50-80% depending on the brewing process, the addition method and the desired hopping level.

* When using spectrophotometric method, multiplication factor is recommended to consider the relatively greater impact on perceived bitterness.

AROMA

The aroma of the extract will be varietal specific. Perception of hoppy character and various related notes in beer will also be varietal specific in some instances and will depend on the quantity of extract added and the time of addition during kettle boil.

ANALYSIS

Iso-alpha acids, residual alpha acids and beta acids are measured by HPLC with the International Calibration Standard (ICS) as reference.

PACKAGING

Standard packaging is available in bulk 55-gallon PET or steel drums or in 0.5 kg, 1 kg, 2 kg, 3 kg and 4 kg tins containing from 200 gr. iso-alpha acids to 2.4 kg iso-alpha acids. A complete list of packaging information can be obtained upon request.

The inner coating of metal tins and drums are approved by the FDA for use with food products and meet the requirements of Food Additive Regulation 21 CFR 175.300. Tin are marked with 16-9000 Food Grade Ink.

IKE is a pure isomerized resin extract of hops that can be standardized to any concentration upon request.

STORAGE

IKE may be stored at room temperature or refrigerated and will remain stable for several years. When stored in closed container under the following conditions, the “Best Use Before Date” will be:

- 2 Years between 35 and 50°F (2 and 10°C) in closed Drums or Tins or
- 18 Months at a temperature higher than 59°F (15°C) in closed Drums or Tins.

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SPECIFICATION SHEET

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	METHOD	TYPICAL ANALYSIS
Identification	UV absorption curve is similar to that of reference standard.	
Iso-alpha-acids*	HPLC - EBC 7.8 or ASBC HOPS - 16 (ICS-13 Std.)	35 - 65% (w/w)
Residual alpha acids	HPLC - EBC 7.8 or ASBC HOPS - 16 (ICE-13 Std.)	< 2.0% (w/w)
Beta acids*	HPLC - EBC 7.8 or ASBC HOPS - 16 (ICE-13 Std.)	10 - 30% (w/w)

	METHOD	TYPICAL ANALYSIS
Lead		< 1.0 ppm
Arsenic		< 0.5 ppm
Cadmium		< 0.03 ppm
Total Heavy Metals (as Pb eq.)		< 10 ppm
Magnesium		< 200 ppm
Iron		Not detectable

* NOTE: Concentration dependent upon hop variety and crop year

SAFETY DATA SHEET

IKE

1. PRODUCT IDENTIFICATION

1.1 Product Name	PURE HOP OIL (Hops Essentials Oils) Made from CO2 Hop Extract
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 Description	Xn Harmful
2.2 Label Elements	R36/38 Irritation to eyes and skin R65 Harmful: May cause lung damage if swallowed
2.3 Other Hazards	Prolonged skin contact could cause dermatitis in some individuals.

3. COMPOSITION, INGREDIENT INFORMATION

3.1 Composition	A slightly acidic solid or resinous phase; concentrate of iso-alpha acids, beta acids, oils and uncharacterized resins produced by CO2 extraction.
3.2 Hazard Components	Not Applicable Product is natural.

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	Dry Powder, Foam, 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 or PET
7.2 Precautions	Avoid prolonged skin contact. Use personal protective equipment (Section 8)
7.3 Storage Conditions	Store at room temperature or at a temperature range of 2°C to 10°C (35°F to 50°F).

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

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Appearance & Odor	Yellow, green or brown resin concentrate with a pungent odor.
9.2 Odor	Typical hoppy, depends on variety
9.3 Odor Threshold	No data available
9.4 pH	4 - 6
9.5 Melting Point	40 – 60° (104 – 140°F), depending on variety
9.6 Boiling Point	> 100°C
9.7 Flash Point	> 100°C
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	0.85 – 1.10
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	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. INFORMATION TRANSPORTATION

14.1 UN Number	Non-hazardous product
14.2 Shipping Name	IKE
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	