



YAKIMA CHIEF HOPS®



PURE HOP OIL

PRODUCT DATA SHEET

PACKAGED BY

Yakima Chief Hops, 306 Division Street, Yakima, WA 98902 USA, Phone (509) 457-3200, Fax (509) 453-1551

DESCRIPTION

Pure Hop Oil is the essential oil fraction derived from supercritical CO₂ hop extract. Pure Hop Oil is virtually free of alpha acids and beta acids and will not provide any bitterness or contribute to a sun struck flavor. The key essential oil compounds found in Hop Oil are β -pinene, myrcene, humulene, caryophyllene and linalool.

PACKAGING & STORAGE

Standard packaging is available in 1 kg and 5 kg aluminum bottles. Pure Hop Oil should be stored at a temperature between 32°F and 42°F (0°C and 5°C). Under these conditions, Pure Hop Oil will remain stable in closed containers for two (2) years.

APPLICATION & USAGE

Pure Hop Oil is generally dosed post-fermentation to provide hoppy aroma/character, and can be used in conjunction with dry hopping, or in full replacement. Pure Hop Oil is generally dosed at levels 5 - 40ml per hectoliter, but normally not to exceed 10ml. Pure Hop Oil may be added without prior dilution to beer after fermentation preferably by metered injection into the beer stream during transfer. The dosing rate for a brewery would completely depend on brew house, beer style and intensity/flavor preferred. Pure Hop Oil dosage amounts can easily be tested in bottles of beer by dosing 5-20 μ l of Pure Hop Oil in a 355ml room temperature bottle of beer and mix by inversion then chilled for two hours under refrigeration. Dilution of Pure Hop Oil at 1ml of oil into 100ml of ethanol and/or propylene glycol can produce a beer soluble matrix, but probably is unnecessary. Pure Hop Oil appears to have enough solubility in beer at these low dosage rates to produce the hoppy character required.

AROMA

Perception of hoppy character and various related notes in beer will depend on the quantity of product added and when the product is added.


PURE HOP OIL

SAFETY DATA SHEET

1. PRODUCT IDENTIFICATION

1.1 Product Name	Pure Hop Oil (Hops Essential Oil, Hops Volatile Oil, Varietal Hop Oils) Made from Hop Pellets
1.2 Supplier	Yakima Chief Hops 306 Division St. Yakima, WA 98902 (USA) Phone: 1.509.453.4792 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	Flammable liquid, Category 3
2.2 Label Elements	 <p>Signal word: Warning Hazard statements: H226 – Flammable liquid and vapor Precautionary statements: P210 – Keep away from heat/sparks/open flames/hot surfaces – No smoking P381 – Eliminate all ignition sources if safe to do so. P403 + 235 – Store in a well ventilated place. Keep cool.</p>
2.3 Other Hazards	Prolonged skin contact could cause dermatitis in some individuals.

3. COMPOSITION, INGREDIENT INFORMATION

3.1 Composition	<p>A concentrate of hop oils produced by CO2 extraction.</p> <table><thead><tr><th>Chemical Name</th><th>CAS-No.</th><th>EC-No.</th><th>Ingredient Percent</th></tr></thead><tbody><tr><td>Hops Oil Concentrate</td><td>8007-04-3N/A</td><td>292-504-3</td><td>>99%</td></tr></tbody></table> <p>There are no additional hazardous ingredients greater than or equal to 1.0 wt% concentration or carcinogenic ingredients greater than or equal to 0.1 wt% concentration.</p>	Chemical Name	CAS-No.	EC-No.	Ingredient Percent	Hops Oil Concentrate	8007-04-3N/A	292-504-3	>99%
Chemical Name	CAS-No.	EC-No.	Ingredient Percent						
Hops Oil Concentrate	8007-04-3N/A	292-504-3	>99%						
3.2 Hazard Components	<p>Not Applicable Product is natural, unrefined and contains no additives.</p>								

4. FIRST AID MEASURES

4.1 Oral Ingestion	<p>Never make and unconscious person vomit or drink fluids. If necessary, rinse mouth with water and provide fresh air. Get medical attention if discomfort continues.</p>
4.2 Eye Contact	<p>Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician if symptoms occur.</p>

4.3 Skin Contact	<p>If irritation occurs, wash off with a disinfectant soap and water. Consult a physician if symptoms occur. Launder contaminated clothing before reuse.</p>
4.4 Inhalation	<p>In case of difficult breathing, move person to fresh air. Consult a physician if symptoms occur.</p>
4.5 Symptoms	<p>None Known</p>

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media	<p>Use alcohol-resistant foam, dry chemical or carbon dioxide spraying extinguishing media to base of flames. Do not use direct water jet on burning material. Avoid open flame and excessive temperatures.</p>
5.2 Hazards from Fire	<p>Closed containers may build up pressure when exposed to heat and should be cooled with water spray. Keep product and empty container away from heat and sources of ignition.</p>
5.3 Advice for firefighters	<p>Wear self-contained breathing apparatus and full protective gear for firefighting if large quantities of product are involved.</p>

6. ACCIDENTAL RELEASE MEASURES

6.1 Procedure	<p>Place waste in an appropriately labeled container for disposal. Recover as much of the material as possible. Care should be taken to avoid environmental release.</p>
6.2 Protective Equipment	<p>Use adequate ventilation or a respirator if in a confined area. Use rubber gloves. Wear Safety Glasses.</p>

7. HANDLING AND STORAGE

7.1 Handling Equipment	Closed Container of Food Grade Quality Brushed aluminum bottles
7.2 Precautions	Avoid prolonged skin contact. Use personal protective equipment (Section 8)
7.3 Storage Conditions	Store in tightly closed original container (preferably high grade stainless steel, glass or aluminum). Store in a cool, dry area away from heat sources and protected from light. Keep air contact to a minimum. Store at room temperature or at a temperature range of -3°C to 5°C (25°F to 41°F).

8. EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 Control and exposure limits	OSHA Standards: No additional data available Threshold Limit Values: No additional data available NIOSH Recommendations: No additional data available
8.2 Engineering Controls	Provide adequate ventilation
8.3 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	Yellowish clear liquid
9.2 Odor	Typical hoppy, depends on variety
9.3 Odor Threshold	No data available
9.4 pH	N/A
9.5 Melting Point	-90°C
9.6 Boiling Point	185°C
9.7 Flash Point	46°C
9.8 Evaporation Rate	No data available
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	0.80 – 0.90
9.14 Solubility in Water	Insoluble
9.15 Partition coefficient	No data available
9.16 Auto-ignition Temperature	415°C
9.17 Decomposition Temperature	No data available
9.18 Viscosity	6 – 7 cP (25°C)

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	Store at a temperature range of -3°C to 5°C (25°F to 41°F), away from heat sources and protected from light. Keep air contact to a minimum.
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 Suspected cancer agent	No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen.
11.4 Reproductive toxicity	This product is not reported to produce mutagenic, embryotoxic, teratogenic, or reproductive effects in humans.


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	UN1197
14.2 Shipping Name	Extracts, flavoring, liquid,3, III
14.3 Hazard Class	3-Class 3 – Flammable and Combustible Liquid 49 CFR 173.120
14.4 Packing Group	III- Minor Danger
14.5 Environmental Hazards	Environmentally Hazardous
14.6 Transport Section	<p>Department of Transportation (DOT)</p> <p>In accordance with DOT</p> <p>Transport document description: UN1197 Extracts, Flavoring, Liquid, 3, III</p> <p>UN-No. (DOT): UN1197</p> <p>Proper Shipping Name (DOT): Extracts Flavoring, liquid</p> <p>Class (DOT): III Minor Danger</p> <p>Hazard Labels (DOT: 3- Flammable Liquid</p>  <p>DOT Packaging Non Bulk (49 CFR 173.xxx): 203</p> <p>DOT Packaging Bulk (49 CFR 173.xxx): 242</p> <p>DOT Special Provisions (49 CFR 172.102): B1- If the material has a flash point at or above 38 C (100 F) and below 93 C (200F), then the bulk packaging requirements of 173.242 of this subchapter is applicable.</p> <p>IB3- Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2; Composite (31HZ1 and 31HA2, 31HB2,31HN2,31HD2 and 31HH2). Additional Requirements: Only liquids with a vapor pressure less than or equal to 110 kPa at 50 C (1.1 bar at 122 F), or 130 kPa at 55 C (1.3 bar at 131 F) are authorized, except for UN2672 (also see special Provisions IP8 in the Table 2 for UN2672)</p> <p>T2- 1.5 178.274(d)(2) Normal.....178.275(d)(3)</p> <p>TP1- The maximum degree of filling must not exceed the degree of filling determined by the following: Degree of filling = $97 / 1 + a (tr - tf)$ Where: tr is the maximum mean bulk temperature during transport, and tf is the temperature in degrees Celsius of the liquid during filling.</p> <p>DOT: Packaging Exceptions (49 CFR 173.xxx): 150</p> <p>DOT Quantity Limitations passenger aircraft/ rail: 60 L (49CFR 173.27</p> <p>DOT Quantity Limitations Cargo aircraft only: 220 L (49 CFR 175.75)</p> <p>DOT Vessel Stowage Location: A- The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.</p>

	<p>Emergency Response Guide (ERG) Number: 127</p> <p>Other information: No supplementary information available.</p> <p>Transport document description (IMDG): UN 1197 EXTRACTS FLAVOURING, LIQUID, 3, III, MARINE POLLUTANT/ENVIROMENTALLY HAZARDOUS</p> <p>Transport by SEA</p> <p>UN-NO. (IMDG): 1197</p> <p>Proper Shipping Name (IMDG): EXTRACTS, FLAVOURING, LIQUID CLASS (IMDG): 3-Flammable liquids</p> <p>Packing Group (IMDG): III – substances presenting low danger</p> <p>Limited Quantities (IMDG): 5 L</p> <p>Air Transport</p> <p>Transport document description (IATA) : UN 1197 Extracts, flavouring, liquid, 3, III, ENVIROMENTALLY HAZARDOUS</p> <p>UN-No. (IATA): 1197</p> <p>Proper Shipping Name (IATA): Extracts, flavouring, liquid</p> <p>Class (IATA): 3-Flammable Liquids</p> <p>Packing Group (IATA): III- Minor Danger</p>
--	---

15. REGULATORY INFORMATION

15.1 Safety, health, and environmental regulations	<p>SARA 302 Components: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.</p> <p>SARA 313 Components: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.</p> <p>SARA 311/312 Hazards: Fire hazard, Acute health hazard, Chronic health hazard</p> <p>TSCA: All components of this product are on the Toxic Substances Control Act.</p> <p>EINECS: No components of this product are on the European Inventory of Existing Commercial Chemical Substances.</p> <p>Canada DSL: All components of this product are on the Canada Domestic Substance List.</p> <p>CA Prop. 65 Components: This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.</p> <p>Heavy Metals, Pesticides/Herbicides/Fungicides, Nitrates, Radioactivity: Below tolerance levels.</p> <p>Allergenic-Free Non-GMO Traceable</p>
15.2 REACH	Not Applicable (No EINECS Ref.)

16. OTHER INFORMATION

16.1 HMIS	Health hazard: 0 Flammability: 2 Physical Hazard 0
16.2 NFPA Rating	Health hazard: 0 Fire Hazard: 2 Reactivity Hazard: 0
16.3 Issue Date	15 August 2019
16.4 Revision Date	
16.5 Other	