SECTION 1: Identification

1.1. Identification
Trade name: Hop Oil, Hop Oil "Type DRY", Hop Oil "Type DRY variety specific" (v.s.), Hop Oil (thin film), Hop Oil (steam distilled)
Chemical name: hop oil
CAS-No.: 8007-04-3

1.2. Recommended use and restrictions on use
Use of the substance/mixture: Manufacturing of food

1.3. Supplier
Manufacturer/Supplier/Importer
S. S. Steiner, Inc.
725 5th Ave. 23 rd Floor
New York, NY 10022 - USA
T +1 212 838 8900

Manufacturer/Supplier/Importer
Simon H. Steiner, Hopfen, GmbH
Auhofstr. 18
Mainburg, 84048 - Germany
T +49-(0)8751-8605-0 - F +49-(0)8751-8605-80

1.4. Emergency telephone number
Emergency number: S. S. Steiner, Inc.
Phone: +1 212 838 8900 (Monday – Friday 08.00 – 17.00, Eastern Time Zone)

Simon H. Steiner, Hopfen, GmbH
Tel.: +49-8751-8605-0 (Monday – Friday 08:00 – 17:00, Central European Time)

Steiner Hops Ltd.
Phone: +44 1992 572 331 (Monday – Friday 08.00 – 17.00, Greenwich Mean Time)

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture
GHS US classification
Flammable liquids Category 3
Skin corrosion/irritation Category 2
Serious eye damage/eye irritation Category 2
Aspiration hazard Category 1

H226 - Flammable liquid and vapour
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H304 - May be fatal if swallowed and enters airways

Full text of H statements: see section 16

2.2. GHS Label elements, including precautionary statements
GHS US labeling
Hazard pictograms (GHS US):

Signal word (GHS US): Danger
Hazard statements (GHS US):
H226 - Flammable liquid and vapour
H304 - May be fatal if swallowed and enters airways
H315 - Causes skin irritation
H319 - Causes serious eye irritation

Precautionary statements (GHS US):
P210 - Keep away from heat, hot surfaces, sparks, open flames. - No smoking.
P273 - Avoid release to the environment.
P280 - Wear protective gloves, eye protection.
SECTION 3: Composition/Information on ingredients

3.1. Substances

<table>
<thead>
<tr>
<th>Substance type</th>
<th>Chemical name</th>
<th>CAS-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-constituent</td>
<td>hop oil</td>
<td>8007-04-3</td>
</tr>
</tbody>
</table>

### Name | Product identifier | % | GHS US classification |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>7-methyl-3-methyleneocta-1,6-diene (Component)</td>
<td>(CAS-No.) 123-35-3</td>
<td>&lt;75</td>
<td>Flam. Liq. 3, H226, Skin Irrit. 2, H315, Eye Irrit. 2, H319, Asp. Tox. 1, H304</td>
</tr>
<tr>
<td>Caryophyllene (Component)</td>
<td>(CAS-No.) 87-44-5</td>
<td>&lt;10</td>
<td>Asp. Tox. 1, H304</td>
</tr>
</tbody>
</table>

Full text of hazard classes and H-statements: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general: Call a physician immediately.

First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing.

First-aid measures after skin contact: Rinse skin with water/shower. Remove/Take off immediately all contaminated clothing. If skin irritation occurs: Get medical advice/attention.

First-aid measures after eye contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

First-aid measures after ingestion: Do not induce vomiting. Call a physician immediately.

4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects after skin contact: Irritation.

Symptoms/effects after eye contact: Eye irritation.

Symptoms/effects after ingestion: Risk of lung edema.

4.3. Immediate medical attention and special treatment, if necessary

Treat symptomatically.

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media


Unsuitable extinguishing media: Strong water jet.

5.2. Specific hazards arising from the chemical

Fire hazard: Flammable liquid and vapour.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions: Cool closed containers exposed to fire with water spray.

Protection during firefighting: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

Other information: Do not allow run-off from fire fighting to enter drains or water courses. Disposal must be done according to official regulations.
SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures: Ventilate spillage area. Avoid breathing mist, vapors, spray. No open flames, no sparks, and no smoking. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Avoid sub-soil penetration. Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment: Collect spillage.

Methods for cleaning up: Cover spill with non-combustible material, e.g.: sand/earth. Take up mechanically (sweeping, shoveling) and collect in suitable container for disposal. Notify authorities if product enters sewers or public waters.

Other information: Disposal must be done according to official regulations.

6.4. Reference to other sections

Information for safe handling. See section 7. Concerning personal protective equipment to use, see section 8. For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Ensure good ventilation of the work station. Avoid breathing mist, vapors, spray. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground/bond container and receiving equipment. Use only non-sparking tools. Take precautionary measures against static discharge. Flammable vapors may accumulate in the container. Use explosion-proof equipment. Wear personal protective equipment. Avoid contact with skin and eyes.

Hygiene measures: Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures: Ground/bond container and receiving equipment.

Storage conditions: Store in a well-ventilated place. Keep cool. Keep container tightly closed. Store locked up.

Maximum storage period: = 1 year(s)

Storage temperature: < 50 °F

Information about storage in one common storage facility: Keep away from food, drink and animal feeding stuffs.

Packaging materials: Aluminum.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

<table>
<thead>
<tr>
<th>Chemical</th>
<th>Control Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-methyl-3-methyleneocta-1,6-diene (123-35-3)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Caryophyllene (87-44-5)</td>
<td>Not applicable</td>
</tr>
</tbody>
</table>

8.2. Appropriate engineering controls

Appropriate engineering controls: Ensure good ventilation of the work station.

Environmental exposure controls: Avoid release to the environment.

8.3. Individual protection measures/Personal protective equipment

Hand protection:
In case of repeated or prolonged contact wear gloves. EN 374. Choosing the proper glove is a decision that depends not only on the type of material, but also on other quality features, which differ for each manufacturer. Please follow the instructions related to the permeability and the penetration time provided by the manufacturer. Gloves must be replaced after each use and whenever signs of wear or perforation appear.

**Eye protection:**

Wear closed safety glasses. EN 166

**Skin and body protection:**

Wear suitable protective clothing

**Respiratory protection:**

Accidental release measures. Filter type: P1. EN 143.

---

### SECTION 9: Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical state</td>
<td>Liquid</td>
</tr>
<tr>
<td>Appearance</td>
<td>clear.</td>
</tr>
<tr>
<td>Color</td>
<td>colorless to slightly yellow</td>
</tr>
<tr>
<td>Odor</td>
<td>characteristic</td>
</tr>
<tr>
<td>Odor threshold</td>
<td>No data available</td>
</tr>
<tr>
<td>pH</td>
<td>No data available</td>
</tr>
<tr>
<td>Melting point</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Freezing point</td>
<td>No data available</td>
</tr>
<tr>
<td>Boiling point</td>
<td>&gt; 160 °F</td>
</tr>
<tr>
<td>Flash point</td>
<td>≈ 107 °F</td>
</tr>
<tr>
<td>Relative evaporation rate (butyl acetate=1)</td>
<td>No data available</td>
</tr>
<tr>
<td>Flammability (solid, gas)</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Vapor pressure</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative vapor density at 20 °C</td>
<td>No data available</td>
</tr>
<tr>
<td>Relative density</td>
<td>No data available</td>
</tr>
<tr>
<td>Specific gravity / density</td>
<td>≈ 1 g/ml (68 °F)</td>
</tr>
<tr>
<td>Solubility</td>
<td>No data available</td>
</tr>
<tr>
<td>Log Pow</td>
<td>No data available</td>
</tr>
<tr>
<td>Auto-ignition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Decomposition temperature</td>
<td>No data available</td>
</tr>
<tr>
<td>Viscosity, kinematic</td>
<td>≈ 46 mm²/s</td>
</tr>
<tr>
<td>Viscosity, dynamic</td>
<td>46 mPa·s (77 °F)</td>
</tr>
<tr>
<td>Explosion limits</td>
<td>No data available</td>
</tr>
<tr>
<td>Explosive properties</td>
<td>Product is not explosive. Explosive vapor/air mixtures may be formed.</td>
</tr>
<tr>
<td>Oxidizing properties</td>
<td>No data available</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

**Other properties:**

No additional information available.

---

### SECTION 10: Stability and reactivity

#### 10.1. Reactivity

Flammable liquid and vapour.

#### 10.2. Chemical stability

Stable under normal conditions. To avoid thermal decomposition, do not overheat.

#### 10.3. Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.
10.4. Conditions to avoid
Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

10.5. Incompatible materials
No additional information available

10.6. Hazardous decomposition products
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral) : Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (dermal) : Not classified (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation) : Not classified (Based on available data, the classification criteria are not met)

<table>
<thead>
<tr>
<th>Compound</th>
<th>LD50 oral rat (mg/kg body weight)</th>
<th>LD50 dermal rabbit (mg/kg body weight)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-methyl-3-methyleneocta-1,6-diene (123-35-3)</td>
<td>&gt; 3380</td>
<td>&gt; 5000</td>
</tr>
</tbody>
</table>

Skin corrosion/irritation : Causes skin irritation.
Serious eye damage/irritation : Causes serious eye irritation.
Respiratory or skin sensitization : Not classified (Based on available data, the classification criteria are not met)
Germ cell mutagenicity : Not classified (Based on available data, the classification criteria are not met)
Carcinogenicity : Not classified (Based on available data, the classification criteria are not met)
Reproductive toxicity : Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity – single exposure : Not classified (Based on available data, the classification criteria are not met)
Specific target organ toxicity – repeated exposure : Not classified (Based on available data, the classification criteria are not met)
Aspiration hazard : May be fatal if swallowed and enters airways.
Viscosity, kinematic : = 46 mm²/s
Symptoms/effects after skin contact : Irritation.
Symptoms/effects after eye contact : Eye irritation.
Symptoms/effects after ingestion : Risk of lung edema.

SECTION 12: Ecological information

12.1. Toxicity
Ecology - general : Very toxic to aquatic life with long lasting effects.

<table>
<thead>
<tr>
<th>Compound</th>
<th>EC50 Daphnia 1 (mg/l) (48h; Daphnia magna; (OECD 202 method))</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-methyl-3-methyleneocta-1,6-diene (123-35-3)</td>
<td>1.47</td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability

<table>
<thead>
<tr>
<th>Compound</th>
<th>Biodegradation (28d; (OECD 301D method))</th>
<th>Persistence and degradability</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-methyl-3-methyleneocta-1,6-diene (123-35-3)</td>
<td>76 %</td>
<td>Not readily biodegradable.</td>
</tr>
<tr>
<td>caryophyllene (87-44-5)</td>
<td>Persistence and degradability : Not readily biodegradable.</td>
<td></td>
</tr>
<tr>
<td>Persistence and degradability : Not readily biodegradable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biodegradation : 10 % (28 d; EU Method C.4-E)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.3. Bioaccumulative potential

<table>
<thead>
<tr>
<th>Compound</th>
<th>Log Pow (pH 6.5; 30°C; (OECD 117 method))</th>
<th>Log Pow (25 °C; pH = 7; (OECD 123 method))</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-methyl-3-methyleneocta-1,6-diene (123-35-3)</td>
<td>4.82</td>
<td>6.23</td>
</tr>
<tr>
<td>caryophyllene (87-44-5)</td>
<td>Log Pow : 6.23 (25 °C; pH = 7; (OECD 123 method))</td>
<td></td>
</tr>
</tbody>
</table>
Hop Oil, Hop Oil "Type DRY", Hop Oil "Type DRY variety specific" (v.s.), Hop Oil (thin film), Hop Oil (steam distilled)
Safety Data Sheet

12.4. Mobility in soil
No additional information available

12.5. Other adverse effects
Other adverse effects : No additional information available.

SECTION 13: Disposal considerations

13.1. Disposal methods
Waste treatment methods : Disposal must be done according to official regulations. Do not dispose of with domestic waste. Do not discharge into drains or the environment. Additional information : Flammable vapors may accumulate in the container.

SECTION 14: Transport information

Department of Transportation (DOT)
In accordance with DOT
Transport document description : UN1197 Extracts, flavoring, liquid, 3, III
UN-No.(DOT) : UN1197
Proper Shipping Name (DOT) : Extracts, flavoring, liquid
Class (DOT) : 3 - Class 3 - Flammable and combustible liquid 49 CFR 173.120
Packing group (DOT) : III - Minor Danger
Hazard labels (DOT) : 3 - Flammable liquid

DOT Packaging Non Bulk (49 CFR 173.xxx) : 203
DOT Packaging Bulk (49 CFR 173.xxx) : 242
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 (200 F), then the bulk packaging requirements of 173.241 of this subchapter are applicable. If the material has a flash point of less than 38 C (100 F), then the bulk packaging requirements of 173.242 of this subchapter are applicable.
IB3 - Authorized IBCs: Metal (31A, 31B and 31N); Rigid plastics (31H1 and 31H2); Composite (31HZ1 and 31HA2, 31HB2, 31HN2, 31HD2 and 31HH2). Additional Requirement: 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 Provision IP8 in Table 2 for UN2672).
T2 - 1.5 178.274(d)(2) Normal.................. 178.275(d)(3)
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.

DOT Packaging Exceptions (49 CFR 173.xxx) : 150
DOT Quantity Limitations Passenger aircraft/rail (49 CFR 173.27) : 60 L
DOT Quantity Limitations Cargo aircraft only (49 CFR 175.75) : 220 L
DOT Vessel Stowage Location : A - The material may be stowed “on deck” or “under deck” on a cargo vessel and on a passenger vessel.
Emergency Response Guide (ERG) Number : 127
Other information : No supplementary information available.

Transportation of Dangerous Goods
Not applicable
Hop Oil, Hop Oil "Type DRY", Hop Oil "Type DRY variety specific" (v.s.), Hop Oil (thin film), Hop Oil (steam distilled)

Safety Data Sheet


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Transport by sea

Transport document description (IMDG) : UN 1197 EXTRACTS, FLAVOURING, LIQUID, 3, III, MARINE POLLUTANT/ENVIRONMENTALLY HAZARDOUS
UN-No. (IMDG) : 1197
Proper Shipping Name (IMDG) : EXTRACTS, FLAVORING, LIQUID
Class (IMDG) : 3 - Flammable liquids
Packing group (IMDG) : III - substances presenting low danger
Limited quantities (IMDG) : 5 L

Air transport

Transport document description (IATA) : UN 1197 Extracts, flavouring, liquid, 3, III, ENVIRONMENTALLY HAZARDOUS
UN-No. (IATA) : 1197
Proper Shipping Name (IATA) : Extracts, flavouring, liquid
Class (IATA) : 3 - Flammable Liquids
Packing group (IATA) : III - Minor Danger

---

SECTION 15: Regulatory information

15.1. US Federal regulations

All chemical substances in this product are listed in the EPA (Environment Protection Agency) TSCA (Toxic Substances Control Act) Inventory

This product or mixture is not known to contain a toxic chemical or chemicals in excess of the applicable de minimis concentration as specified in 40 CFR §372.38(a) subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372.

15.2. International regulations

hop oil (8007-04-3)
Manufacturing of food

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm.

---

SECTION 16: Other information


Revision date : 04/17/2019
Department issuing data specification sheet: KFT Chemieservice GmbH
Im Leuschnerpark 3 64347 Griesheim
Postfach 1451 64345 Griesheim
Germany
Phone: +49 6155-8981-400 Fax: +49 6155 8981-500
Safety Data Sheet Service: +49 6155 8981-522
Contact person : Stefanie Zgorzelski

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Hop Oil, Hop Oil "Type DRY", Hop Oil "Type DRY variety specific" (v.s.), Hop Oil (thin film), Hop Oil (steam distilled)

Full text of H-phrases:

<table>
<thead>
<tr>
<th>H226</th>
<th>Flammable liquid and vapour</th>
</tr>
</thead>
<tbody>
<tr>
<td>H304</td>
<td>May be fatal if swallowed and enters airways</td>
</tr>
<tr>
<td>H315</td>
<td>Causes skin irritation</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation</td>
</tr>
</tbody>
</table>

Abbreviations and acronyms:

<table>
<thead>
<tr>
<th>ADN</th>
<th>European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADR</td>
<td>European Agreement concerning the International Carriage of Dangerous Goods by Road</td>
</tr>
<tr>
<td>ATE</td>
<td>Acute Toxicity Estimate</td>
</tr>
<tr>
<td>BCF</td>
<td>Bioconcentration factor</td>
</tr>
<tr>
<td>CLP</td>
<td>Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008</td>
</tr>
<tr>
<td>DMEL</td>
<td>Derived Minimal Effect level</td>
</tr>
<tr>
<td>DNEL</td>
<td>Derived-No Effect Level</td>
</tr>
<tr>
<td>DPD</td>
<td>Dangerous Preparations Directive 1999/45/EC</td>
</tr>
<tr>
<td>DSD</td>
<td>Dangerous Substances Directive 67/548/EEC</td>
</tr>
<tr>
<td>EC50</td>
<td>Median effective concentration</td>
</tr>
<tr>
<td>IARC</td>
<td>International Agency for Research on Cancer</td>
</tr>
<tr>
<td>IATA</td>
<td>International Air Transport Association</td>
</tr>
<tr>
<td>IMDG</td>
<td>International Maritime Dangerous Goods</td>
</tr>
<tr>
<td>LC50</td>
<td>Median lethal concentration</td>
</tr>
<tr>
<td>LD50</td>
<td>Median lethal dose</td>
</tr>
<tr>
<td>LOAEL</td>
<td>Lowest Observed Adverse Effect Level</td>
</tr>
<tr>
<td>NOAEC</td>
<td>No-Observed Adverse Effect Concentration</td>
</tr>
<tr>
<td>NOAEL</td>
<td>No-Observed Adverse Effect Level</td>
</tr>
<tr>
<td>NOEC</td>
<td>No-Observed Effect Concentration</td>
</tr>
<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
</tr>
<tr>
<td>PBT</td>
<td>Persistent Bioaccumulative Toxic</td>
</tr>
<tr>
<td>PNEC</td>
<td>Predicted No-Effect Concentration</td>
</tr>
<tr>
<td>RID</td>
<td>Regulations concerning the International Carriage of Dangerous Goods by Rail</td>
</tr>
<tr>
<td>SDS</td>
<td>Safety Data Sheet</td>
</tr>
<tr>
<td>STP</td>
<td>Sewage treatment plant</td>
</tr>
<tr>
<td>TLM</td>
<td>Median Tolerance Limit</td>
</tr>
<tr>
<td>vPvB</td>
<td>Very Persistent and Very Bioaccumulative</td>
</tr>
</tbody>
</table>

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.