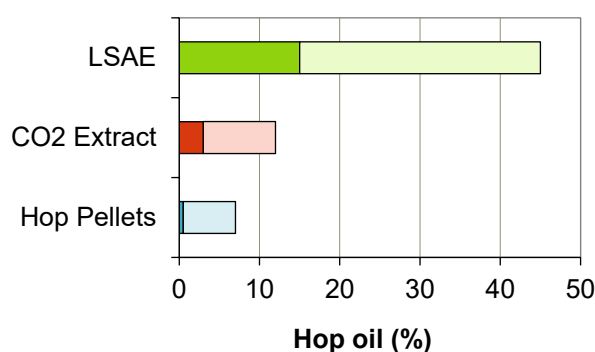


Light Stable AromaExtract

❖ Overview

- **Light Stable AromaExtract (LSAE)** is an enriched hop oil product derived from CO₂ hop extract.
- **LSAE** is light stable and free of hop bitter acids.
- **LSAE** can be added early to the wort kettle as an antifoam agent. If added late in the boil, this product imparts a distinct hop aroma to beer.
- **LSAE** does not contribute to the sensory bitterness of beer.

Comparison of hop oil concentrations in hop products



❖ Specifications

- Description: dark brown, semisolid extract containing hop essential oils and waxes
- Hop oil*: 15 – 45 %
- Beta acids*: < 20 %
- Iso-alpha acids: below detection limit
- Alpha acids: below detection limit
- pH: 7.5 – 8.0
- Viscosity: 35 – 50 mPas at 50 °C (122 °F)
- Density: 1.0 g/ml at 20 °C (68 °F)

*dependent on variety and crop year

❖ Properties

• Appearance

LSAE is a dark brown, semisolid or moderately viscous paste which becomes fluid when warmed.

• Utilization

Actual utilization will vary from brewery to brewery due to differences in equipment and process conditions.

• Light Stability

LSAE only provides protection against lightstruck flavor in the complete absence of alpha acids and iso-alpha acids. **LSAE** can be used in conjunction with any Hopsteiner® light stable product to achieve light stability.

• Flavor

LSAE provides hop aroma when added to the kettle. Late kettle additions enhance the hop character of the finished beer.

• Quality

All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards.

❖ Packaging

LSAE can be packaged in cans and pails according to customer requirements:

Cans: 0.5 to 4 kg (USA)
0.5 to 4.2 kg (Germany)
Pails: 4 to 20 kg (USA only)
Drums: 50 and 200 kg

❖ Product Use

LSAE is typically added to the wort kettle to achieve a characteristic hop aroma. An early addition suppresses foam formation at the beginning of wort boiling.

• Dosage

Actual dosage of **LSAE** will depend on the extract analysis (hop oil content), time of the addition and the desired intensity of the hop aroma.

Example: (hop oil content of 30 %)

Add 6.7 g/hl **LSAE** toward the end of the boil. This corresponds to a hop oil addition of 2.0 g/hl.

• Application

Pre-warming cans of **LSAE** is not necessary. Suspending punctured cans in the boiling wort will ensure that all of the extract is completely flushed out into the kettle.

If **LSAE** is added by means of automatic dosing units, it should be warmed to 45 °C (113 °F) and gently mixed to ensure perfect dosing.

- **For Light Stable Beer**

For maximum protection against lightstruck flavor, it is essential that no other sources of non-reduced iso-alpha acids are inadvertently introduced into the wort or beer. Therefore, the following must be carefully implemented:

- exclusive use of light stable hop products throughout the entire process
- avoid contamination through equipment surfaces previously in contact with regular iso-alpha acids
- never pitch wort with yeast that has been in contact with regular alpha and iso-alpha acids

- **Storage**

LSAE should be stored in sealed containers at temperatures < 10 °C (50 °F). Opened containers should be used within a few days.

- **Best Before Date**

LSAE is stable for six years from the date it was produced / packaged if stored under the recommended conditions.

- **Safety**

LSAE should be handled like regular CO₂ hop extract. Any product coming into contact with the skin should be washed off immediately with soap and water or an appropriate hand cleanser. If **LSAE** gets into the eyes, flush with copious amounts of water until clear and seek medical attention. For full safety information, please refer to the relevant Hopsteiner® safety data sheet.

❖ Analytical Methods

- **Concentration of Hop Oil**

The hop oil concentration can be measured using the following methods:

- Analytica-EBC 7.10
- ASBC Hops-13

- **Concentration of Beta Acids**

Beta acids (as well as iso-alpha acids and alpha acids) can be measured using the following methods:

- HPLC according to Analytica-EBC 7.8 or ASBC Hops-16 with the current ICS and ICE standards

❖ Technical Support

We are pleased to offer assistance and advice on the full range of Hopsteiner® products:

- copies of all relevant analytical procedures
- Safety Data Sheets (SDS)
- assistance with pilot or full-scale brewing trials
- special analytical services

Disclaimer: The information provided in this document is believed to be correct and valid. However, Hopsteiner® does not guarantee that the information provided here is complete or accurate and thus assumes no liability for any consequences resulting from its application.