

# LIGHT STABLE AROMAEXTRACT

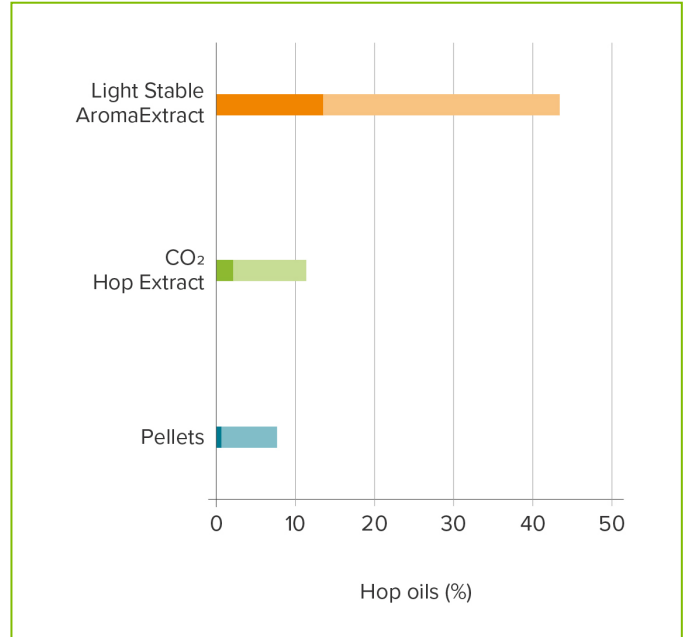
## OVERVIEW

**LSAE** is derived from CO<sub>2</sub> hop extract and contains primarily hop essential oils and beta acids.

**LSAE** is light stable and free of hop bitter acids.

**LSAE** is added late in the boil to impart a distinct hop aroma to beer. If added early to the wort kettle, it can be used as an antifoam agent.

**LSAE** does not contribute to the sensory bitterness of beer.



## SPECIFICATIONS

<b>Short description</b>	light stable hop extract with high content of essential hop oils
<b>Alpha acids</b>	below detection limit
<b>Iso-alpha acids</b>	below detection limit
<b>Beta acids</b>	< 20 %
<b>Hop oils</b>	15 - 45 %
<b>pH</b>	7.5 - 8.0
<b>Density</b>	ca. 1.0 g / ml (20 °C / 68 °F)
<b>Viscosity</b>	35 - 50 mPas (50 °C / 122 °F)

## PROPERTIES

### APPEARANCE

LSAE is a dark brown, semisolid or moderately viscous extract.

### FLAVOR

LSAE provides hop character when added to the kettle. Late kettle additions impart a typical “late hop” aroma to the finished beer. The flavor depends on quantity used and the time of addition. LSAE does not contribute to beer bitterness.

### 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.

### QUALITY

All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards. A monitoring system for residues is in place.

## PACKAGING

Our products are delivered in their respective recommended standard packaging. Alternatives may be possible upon customer request.

Standard packages of our processing plants in the USA (US) and Germany (DE) are:

- Cans 0.5 - 4.0 kg (US)
- Cans 0.5 - 3.1 kg (DE)
- Pail 4 - 20 kg (US)
- Drum 200 kg (US / DE)

## USAGE

LSEAE is typically added to the kettle to achieve a characteristic hop aroma. An early addition aids in suppressing foam formation at the beginning of wort boiling.

### 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.

### DOSAGE

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

Example: (hop oil content of 30 %)

Add 6.7 g/hl LSEAE towards the end of the boiling. This corresponds to a hop oil addition of 2.0 g/hl.

### APPLICATION

Pre-warming cans of LSEAE 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 LSEAE is added by means of automatic dosing units, it should be warmed to 45 °C (113 °F) and gently mixed to ensure perfect dosing.

### STORAGE

The recommended storage temperature in the original unopened packaging is < 10 °C (50 °F).

Short-term, transport-related temperature deviations do not affect product quality.

### BEST BEFORE DATE

Under the recommended storage conditions, the shelf life from the date of production/ packaging is at least 6 years.

### SAFETY

Ensure good ventilation of the workplace and wear personal protective equipment. Avoid contact with eyes and skin. Do not inhale vapors or dusts. For full safety information, please refer to the relevant Hopsteiner® safety data sheet.

## ANALYTICAL METHODS

International approved methods listed in committees such as ASBC or Analytica-EBC using current standards are applied.

### PRODUCT ANALYTICS

Concentration of hop oils

- Analytica-EBC 7.10 (Distillation)
- ASBC Hops-13 (Distillation)

Concentration of bitter substances

- Analytica-EBC 7.8 (HPLC)
- ASBC Hops-16 (HPLC)

## TECHNICAL SUPPORT

We are pleased to offer assistance and advice on:

- safety data sheets
- support for brewing trials on a pilot or commercial scale
- analytical services and information about analytical procedures

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.

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