Light Stable AromaExtract

❖ Overview

• **Light Stable AromaExtract (LSAE)** is an enriched hop oil product derived from CO₂ 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.

❖ 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.

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.

• Addition
  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.

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
• **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 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.

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**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

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**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.