Isomerized Kettle Extract

Overview

- **Isomerized Kettle Extract (IKE)** primarily contains isomerized alpha acids, beta acids and hop oils. Due to pre-isomerization of the alpha acids, yields in the brewing process are higher.

- IKE is produced from CO₂ extract and can be used as a partial or complete replacement for CO₂ extract.

- IKE can also be utilized as a late hop addition at the end of wort boiling. In this case, a distinctive hop aroma in beer can be achieved with a similar level of hop utilization.

Specifications

- **Description**: golden green to amber or pale brown extract; flows at room temperature (liquid)
- Iso-alpha acids*: 40 – 60 %
- Alpha acids*: < 2 %
- Beta acids*: 15 – 30 %
- Hop oil*: 3 – 12 %
- pH: 2.5 (± 0.5)
- Viscosity*: 50 – 100 mPas at 40 °C (104 °F)
- Density: 0.9 – 1.0 g/ml at 20 °C (68 °F)

*dependent on variety and crop year

![Comparative linalool recovery CO₂ extract and IKE](image-url)
**Properties**

- **Appearance**
  IKE is golden green to amber or pale brown in color and substantially less viscous than the corresponding CO₂ extract.

- **Utilization**
  Based on HPLC analysis of the finished beer, utilization of iso-alpha acids can be as high as 45 – 60 %. Calculations of utilization for IKE are based on the assumption that the iso-alpha acid yield is likely to be approx. 50 % higher than that achieved with non-isomerized extracts.
  Late additions of IKE greatly enhance hop oil retention. Actual utilization will vary from brewery to brewery due to differences in equipment and process conditions.

- **Flavor**
  Beers with identical aroma and flavor profiles can be produced when IKE is used in place of CO₂ extract. If added at the end of the boil, IKE imparts a typical late hop aroma to the beer.

- **Chemical Residues**
  Nitrate and heavy metals are almost entirely eliminated in IKE. In addition, many pesticide and fungicide residues are largely removed by the previous CO₂ extraction process.

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

**Packaging**

IKE can be packaged in cans, pails and drums 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

IKE can be produced to any alpha acid concentration desired by our customers and packaged in cans (e.g. 450 g of iso alpha acids per can).

Alternatively, the alpha acid content of IKE can be standardized to any given concentration using glucose syrup (non-GMO glucose cannot be guaranteed). The container is then filled to a standard weight (e.g. 30 % iso alpha acids in 1 kg cans).

**Product Use**

IKE is typically added to the wort kettle as a complete or partial replacement for CO₂ extract.

- **Dosage**
  Kettle additions of IKE are based on the concentration of iso-alpha acids, an estimated or known utilization and the desired intensity of bitterness in the beer.

- **Addition**
  IKE can be added in similar ways to regular kettle extracts. IKE can be added to the kettle when the transfer of lauter wort to the kettle commences, at the beginning of the boil or up to five minutes before casting out the wort.
Pre-warming cans of IKE 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 IKE is added by means of automatic dosing units, it should be warmed to 30 °C (82 °F) and gently mixed to ensure perfect dosing.

Note: Ensure that the dosing equipment is capable of handling products with a low pH value.

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

• Best Before Date
IKE is stable for two years from the date it was produced / packaged if stored under the recommended conditions.

• Safety
IKE is mildly corrosive due to its low pH. It should be handled in the same way as conventional kettle extract. Any product coming into contact with the skin should be immediately washed off with soap and water. If IKE 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 Bitter Substances
Iso-alpha, alpha and beta 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

• Concentration of Hop Oil
The hop oil concentration can be measured using the following methods:
  – Analytica-EBC 7.10
  – ASBC Hops-13

▶ Technical Support

We are pleased to offer assistance and advice on the full range of Hopsteiner® products:
  o copies of all relevant analytical procedures
  o Safety Data Sheets (SDS)
  o assistance with pilot or full-scale brewing trials
  o special analytical services

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