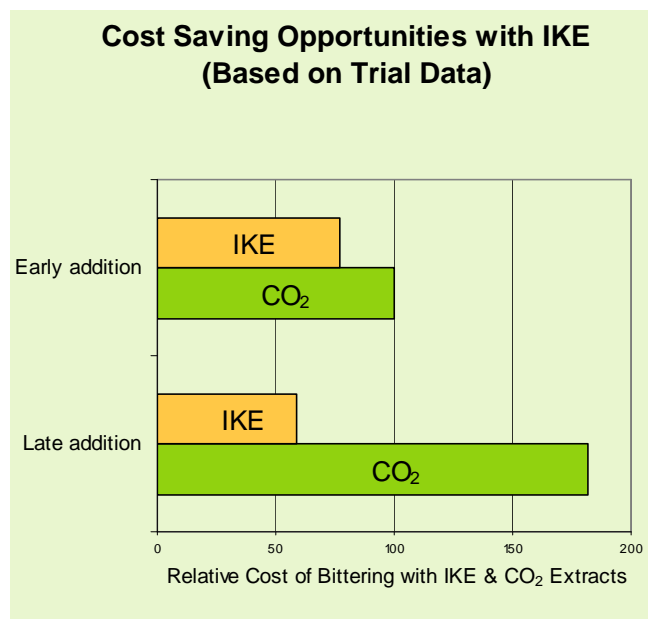


Isomerized Kettle Extract (IKE)

❖ Overview

- **Isomerized Kettle Extract (IKE)** contains isomerized α -acids, β -acids and hop oils.
- **IKE** is produced from CO_2 extract and can be used as a complete replacement for normal or late-addition kettle extract.
- **IKE** produces a similar flavor to CO_2 extract whilst greatly improving the utilization of iso- α -acids.



❖ Specification

- **Description:** A solvent-free, non-aqueous mixture of the free acid form of isomerized α -acids, β -resins and oils.
- **Iso-alpha-acids:** Iso- α -acid content varies according to the hop variety used but is typically in the range 40 – 60 %
- **Alpha-acids:** Typically < 2 %
- **Beta-acids:** Typically 15 – 40 % (depending on variety)
- **Hop oils:** Typically 3 – 12 % (depending on variety)
- **Density:** Typically 0.9 – 1.0 g/ml.

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❖ Properties

□ Appearance

A golden or pale brown thick syrup which becomes more fluid on warming; substantially more mobile than corresponding CO₂ extract.

□ Utilization

Based on HPLC analyses (using the DCHA Iso standard) utilization of iso- α in final beer can be as high as 45 – 55 % when the extract is added at the start of the boil. Trials have also shown that hop oil retention in late addition brews is greatly enhanced when using **IKE** (up to 4 times).

□ Flavor

Brewing trials show that beers of identical aroma and taste can be produced when **IKE** is used as a direct replacement for normal CO₂ extract. However care must be taken to ensure that late addition of **IKE** does not result in excessive hop character due to the increased retention of hop oil in final beer.

□ Quality

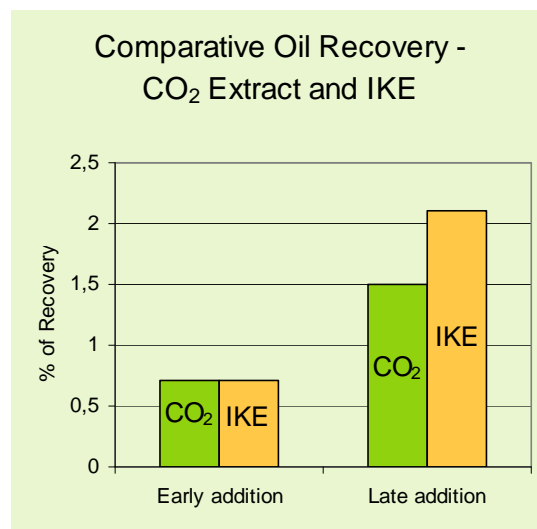
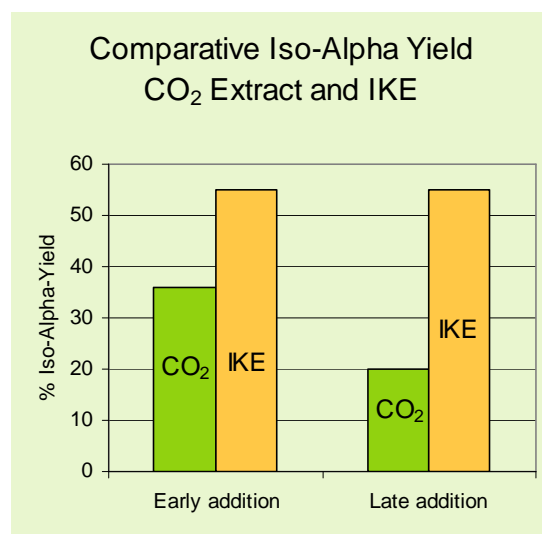
All Hopsteiner® products are produced in plants accredited to internationally accepted quality standards.

❖ Packaging

IKE is normally packaged in 20 kg pails (44 lbs). It can also be packaged in cans and bulk drums according to customer requirements.

For convenience of use, customers may have their extract packed in cans to any desired content of iso- α -acids per container (e.g. 450 g iso- α per can).

Alternatively, the iso- α -acids content of **IKE** can be standardized to any particular concentration using glucose syrup (non-GM glucose cannot be guaranteed) and the container filled to a standard weight (e.g. 30 % iso- α in 1-kg cans).



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❖ Product Use

Typically used in the kettle as 100 % replacement for normal kettle extracts.

❑ Dosage

Calculation is based on the iso-alpha concentration in the **IKE** and the assumption that the utilization of the iso- α is likely to be at least 50 % better than that achieved with the alpha in normal extracts. Actual utilization will vary from brewery to brewery depending on plant and process conditions.

❑ Addition

Handled in bulk, **IKE** should be warmed to c. 30°C (82°F) before use; otherwise **IKE** can be added in similar ways to normal kettle extracts. **IKE** can be added into the kettle either at the start of filling, at the start of the boil or up to 5 min before kettle cast. Because of its lower viscosity, it particularly lends itself to bulk handling and dosing.

❑ Storage

IKE should be stored in sealed containers at < 10°C (50°F). Opened containers should be used up quickly.

❑ Best Before Date

IKE is stable 2 years from date of production under the recommended storage conditions.

❑ Safety

IKE is mildly corrosive due to its low pH. It should be handled in a similar way to normal kettle extract. Any material coming into contact with the skin should be washed off with soap and water. If **IKE** gets into the eyes, irrigate immediately with excess water until clear and seek medical attention.

For full safety information please see the relevant Steiner material safety data sheet.

❖ Analytical Methods

❑ Concentrations of Iso- α -acids, β -acids and residual α -acids

The concentrations of iso- α -, β - and α -acids are measured by HPLC using the current ICS & ICE standards according to EBC 7.8 method; sample preparation according to the EBC method 7.7.

Alternatively, the chromatographic conditions of ASBC Hops-15 may be used.

❑ Concentrations of Hop oils

Hop oil concentration is measured by either the IOB 6.3 or ASBC hops-13 method.

❖ Technical Support

We will be pleased to offer help and advice on the full range of Hopsteiner® products:

- ❑ Copies of all relevant analytical procedures
- ❑ Material Safety Data Sheets (MSDS)
- ❑ Assistance with pilot or full brewery trials
- ❑ Specialist analytical services

❖ Patent

IKE is produced under the conditions of US patent No. 5,370,897.

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