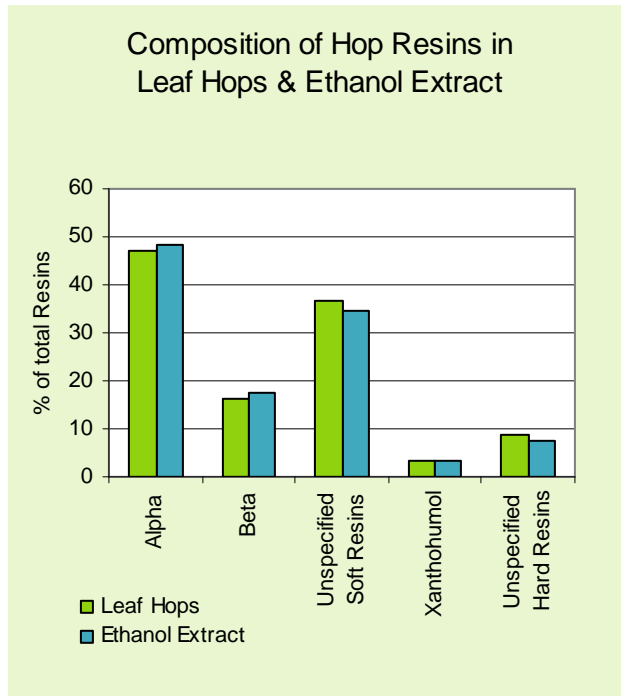


## Ethanol Extract

### ❖ Overview

- **Ethanol Extract** is produced from aroma or bitter hops using pure fermentation alcohol. It contains the complete range of hop resins and oils.
- **Ethanol Extract** is added into the kettle and can be used as a partial or complete replacement for kettle hops or pellets.
- **Ethanol Extract** produces comparable bitter flavor and similar utilization to other pure resin extracts.



### ❖ Specification

- **Description:** A viscous, dark green extract at room temperature.
- **Iso-alpha-acids:** 0.5 – 2.0 %
- **Alpha-acids:** 20 – 55 % (depending on variety)
- **Beta-acids:** 15 – 40 % (depending on variety)
- **Hop Oils:** Typically 3 – 12 % (depending on variety)
- **Solvent residue:** Ethanol content < 0.3 %
- **Viscosity:** Approx. 10,000 mPas at 30°C; approx. 1,000 mPas at 50°C
- **Density:** Approx. 1.0 g/ml

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## ❖ Properties

### ❑ Appearance

A dark green, thick syrup / paste which becomes more mobile on warming.

### ❑ Utilization

Depending on process conditions, the utilization of the  $\alpha$ -acids in **Ethanol Extract** into the beer is between 30 – 40 %. In the early stages of boiling **Ethanol Extract** shows a slower rate of isomerization compared to pellets; however, after 25 – 30 minutes, isomerization is greater than pellets.

### ❑ Flavor

The flavor characteristics of the original hops are maintained. Early addition of the **Ethanol Extract** during wort boiling provides bitterness whilst late addition imparts some hop character due to the retention of some hop oils in the wort.

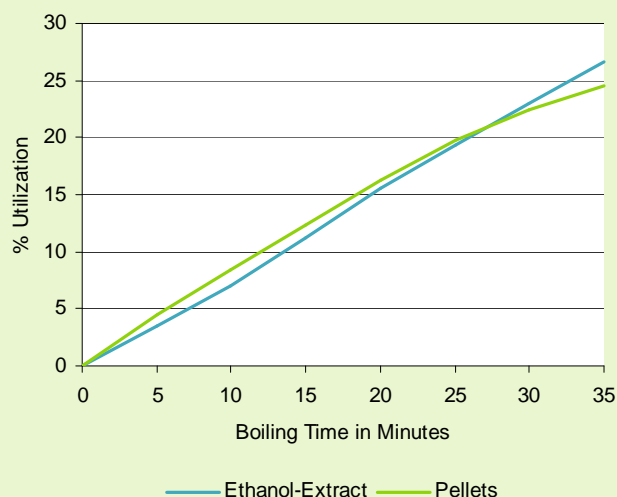
### ❑ Chemical Residues

Nitrates and heavy metals are significantly reduced in **Ethanol Extract**. Pesticides residues are also largely removed by Ethanol Extraction.

### ❑ Quality

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

Formation of Iso- $\alpha$ -Acids during Boiling using Ethanol Extract and Type 45 Pellets



## ❖ Packaging

**Ethanol Extract** is usually packaged either in cans ranging from 1 – 10 kgs. (2 – 22 lbs.) or in 50 & 200 kgs. (110 – 441 lbs.) drums.

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

Alternatively, the  $\alpha$ -acids content of **Ethanol Extract** can be standardized to any particular concentration using tannin extract or glucose syrup (non-GM glucose cannot be guaranteed) and the container filled to a standard weight (e.g. 30 % alpha in 1-kg cans).

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## ❖ Product Use

**Ethanol Extract** is typically added into the kettle as a complete or partial replacement for leaf hops or pellets.

### ❑ Dosage

Addition to the kettle is based on the  $\alpha$ -acid content of the extract and an assumed utilization of 35 %. Actual utilization will vary from brewery to brewery depending on plant and conditions.

### ❑ Addition

For the best utilization **Ethanol Extract** should be added early in wort boiling. However, owing to likely losses caused by protein precipitation, the product is best added 10 minutes after the start of boiling.

If **Ethanol Extract** is used in cans, it does not need to be warmed prior to use. Punctured containers suspended into the boiling wort will ensure that all of the extract is completely flushed out into the wort.

Should **Ethanol Extract** be used in automatic dosing units, the extract must be warmed to a temperature of 45°C (113°F) and gently mixed to ensure perfect dosing.

### ❑ Storage

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

### ❑ Best Before Date

**Ethanol Extract** is stable 4 years from date of production under the recommended storage conditions.

### ❑ Safety

Any material coming into contact with the skin should be washed off with soap and water. If **Ethanol Extract** gets into the eyes, irrigate 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 $\alpha$ - and $\beta$ -acids

Bitter-acid concentration is measured by using the EBC 7.6 (lead conductance value) and EBC 7.8 (iso- $\alpha$ -acids by HPLC). **Ethanol Extract** is normally used according to its Conductometric Bitter Value. (Note: CBV = LCV (EBC 7.6) + 50 % of the iso- $\alpha$ -acids.)

### ❑ Concentrations of Hop oils

Upon request, hop oil concentration can be 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

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