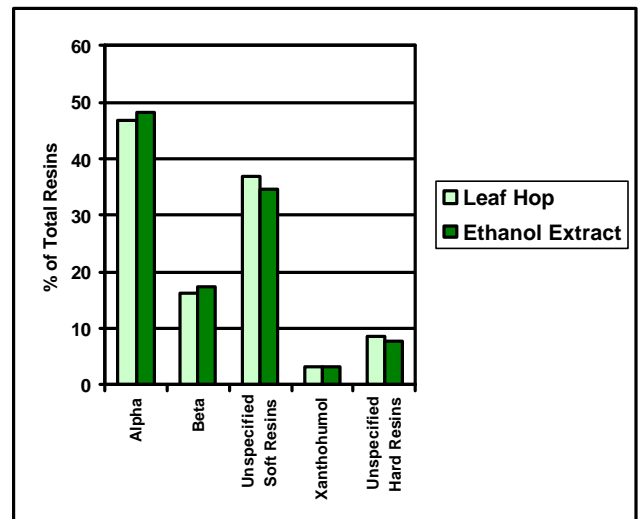


Ethanol Extract

❖ 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.

Composition of Hop resins in Leaf Hops & Ethanol Extract



❖ 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

❖ Properties

□ Appearance:

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

□ Utilization:

Depending on process conditions, the utilization of the α -acids in **Ethanol Extract** 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.

□ Stability:

Ethanol Extract in the form of pure resin extract is stable for several years when stored below 10°C. Opened containers should be used within 3 – 4 weeks.

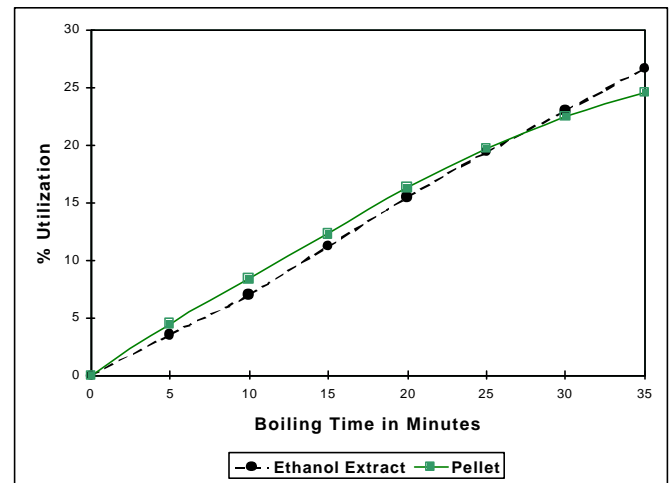
□ Chemical Residues:

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- α -Acids during Boiling using Ethanol Extract & 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 α -acids per container (e.g. 450 g alpha per can).

Alternatively, the α -acids content of **Ethanol Extract** 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% alpha in 1-kg cans).

❖ 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 α -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.

□ Safety:

Ethanol Extract is a non-toxic material. 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

□ Concentration of α - and β -acids:

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

□ Concentration of Hop oils:

Upon request, hop oil concentration can be measured by either the IOB 6.3 or ASBC hops-13 method.

□ Standardization:

If required, the concentration of the α -acids can be standardized to specified levels by the addition of glucose syrup. More conveniently, containers can be packed with a specified amount of alpha (CBV) per can.

❖ 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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