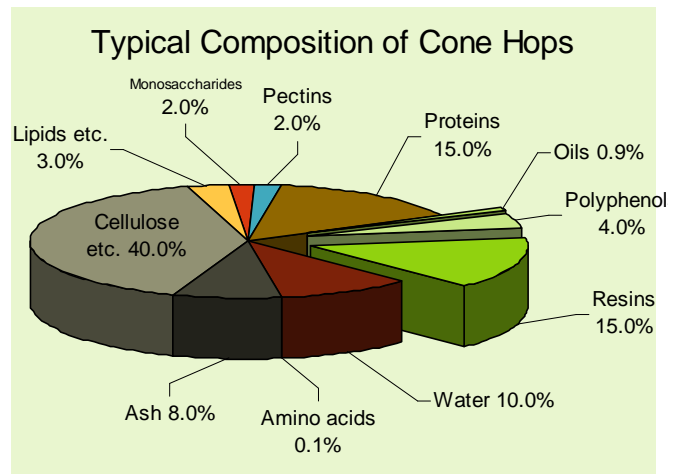


Cone Hops (as baled hops)

❖ Overview

- **Cone Hops** are simply kiln-dried, natural hop cones. Their brewing value lies primarily in their content of oils, resins (mainly consisting of α - and β -acids) and polyphenols.
- **Cone Hops** are used in the brewhouse for adding bitterness and aroma to the wort or additionally for dry-hopping beer.
- **Cone Hops** have a limited stability and cold storage is always recommended.



❖ Specification

- **Description:** Dried and compressed whole hop cones, having an oval or round shape depending on variety
- **Color:** Typically green (depending on variety)
- **Alpha-acids:** Typically 1 – 18 % α -acids (depending on variety)
- **Beta-acids:** Typically 1 – 12 % β -acids (depending on variety)
- **Hop oils:** Typically 1 – 3 % (depending on variety)
- **Moisture:** Typically 7 – 11 %

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❖ Properties

□ Appearance

Green, “leaf” hops. **Cone Hops** in bale form should be as complete cones with little breakage and minimal true leaf or stem (hop bine) material. In some varieties the cones have a striped appearance due to natural color variation.

□ Utilization

As an early kettle addition (up to 15 min. after start of the boil), utilization of α -acids into beer is normally in the range 25 – 28 %. When **Cone Hops** are added late in the boil, utilization can typically reduce to 15 - 20 % or even less, depending on the specific process conditions.

□ Flavor

Cone Hops provide bitterness and aroma to the beer. Flavor will depend on hop variety. Their content of polyphenols may influence both the flavor and haze stabilities of the beer.

□ Quality

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

❖ Packaging

Cone Hops are normally pressed and wrapped with burlap or polypropylene cloth. $\frac{1}{4}$ or $\frac{1}{2}$ bales can be vacuum packed in laminated polythene / metallised polyester foils and further packed into cartons. Bales are typically rectangular, but sizes and shapes may vary, especially by growing region. They are normally prepared as 40 kg (88 lbs), 60 kg (132 lbs), 80 kg (176 lbs) or 90 kg (200 lbs) nominal size bales.

❖ Product Use

□ Dosage

The quantity of **Cone Hops** needing to be added at an early stage of the wort boil in order to achieve the desired bitterness can be calculated using the α -acid content and an estimated utilization of 25 – 28 %. Late addition of hops (typically 5 – 20 min. from the end of the boil) reduces the α -acids utilization, but increases the aromatic flavor. To establish the impact of late addition on beer aroma, trial brews are recommended as the quality and quantity of hop oil content will vary between varieties.

□ Addition

For primary bittering or “late kettle” hopping, **Cone Hops** can be manually weighed and added directly into the kettle.

Dry hopping normally involves the addition of **Cone Hops** during secondary fermentation, maturation or even into the finished beer in casks prior to dispatch of draft beer. This form of hopping is traditionally used in ale brewing to achieve unique and distinctive hop aroma and flavor. For dry hopping, “noble” aroma hop varieties and/or varieties with lower α -acids concentration are normally preferred.

□ Storage

Cone Hops should be stored dark at $< 5^{\circ}\text{C}$ (41°F) and the bales never allowed to become wet as composting and even self-ignition may occur.

□ Best Before Date

Cone Hops should be used within one year from harvesting and should be stored in dark and cold conditions. Losses of α -acids can be as high as 50% or more per annum depending upon variety, crop year and storage conditions.

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❑ Safety

There are no known, serious health hazards in normal use. If dust is generated, it is advisable to wear a dust mask. Always be aware that **Cone Hops** are a combustible material, especially the “High” or “Super High” Alpha varieties.

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

❖ Analytical Methods

❑ Concentrations of α - and β -acids

α - and β -acids can be measured by any of the following:

- ASBC Spectrophotometric method (Hops-6) - (α - and β -acids)
- IOB method 6.4 (α -acid, conductometric)
- EBC method 7.5 (α -acid, conductometric)
- By HPLC, using the current ICE standard, according to the EBC 7.7 method, IOB method 6.5 or the ASBC method (Hops-14) - (α - and β -acids)

❑ Concentrations of Hop oils

Hop oil concentration can be measured by the following methods:

- EBC 7.10
- IOB 6.3 method
- ASBC hops-13

❖ 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