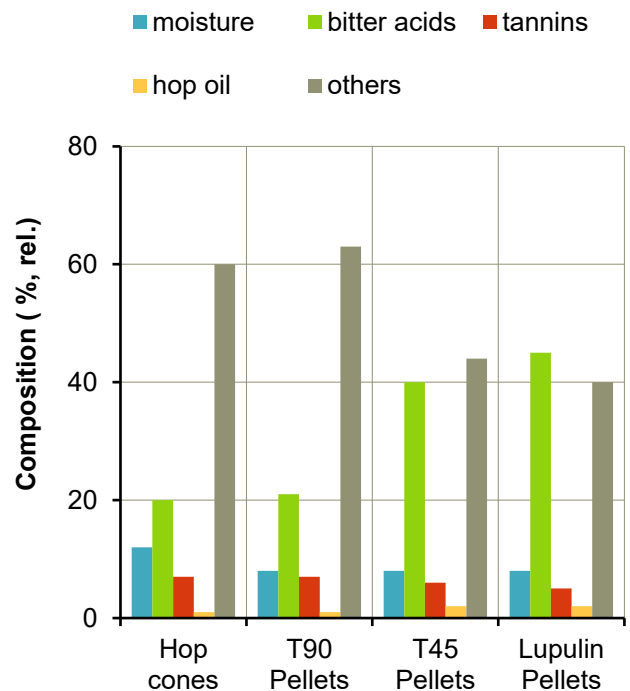


## Lupulin Pellets

### ❖ Overview

- **Lupulin Pellets** are a hop product made from leaf hops, added to the wort kettle during the boiling process. They contribute to the desired bitterness of a beer as well as its characteristic hop aroma.
- **Lupulin Pellets** are suitable for use on the cold side (dry hopping) of the brewing process. They impart a pronounced hop aroma to beer. Moreover, the high concentrations of alpha acids and hop oil in this product are advantageous for breweries adding large quantities of hops in the whirlpool.
- Through the enrichment of bitter acids and essential oils, transportation and storage costs are lower for **Lupulin Pellets**. Furthermore, beer losses can be reduced.



### ❖ Specifications

- Description: cylindrical pellets produced from mechanically purified hop powder
- Color\*: yellow-green
- Alpha acids\*: 6 – 35 %
- Beta acids\*: 5 – 20 %
- Hop oil\*: 1 – 10 ml/100g
- Moisture content: 6 – 9 %

\*dependent on variety and crop year

## ❖ Properties

### • Appearance

**Lupulin Pellets** are a yellow-green pellets, approximately 6 mm x 10 – 15 mm in size (diameter x length).

### • Utilization

Given as an early kettle addition (up to 15 min after the boil begins), hop utilization is normally within a range of 30 – 35 %. When **Lupulin Pellets** are added late in the boil, utilization can decline to 20 % or less, depending on individual process conditions. Both additions can vary depending on the desired intensity and the beer style.

### • Flavor

**Lupulin Pellets** produce flavors in beer indistinguishable from those of leaf hops. **Lupulin Pellets** provide bitterness and aroma to the beer. The flavor depends on the variety, quantity and time of the addition. For further information, please refer to the hop variety data sheets.

### • Quality

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

## ❖ Packaging

**Lupulin Pellets** are packaged in metallized five-layer foil bags which are then packed in boxes. These are available as 'soft' packs flushed with inert gas (N<sub>2</sub> and/or CO<sub>2</sub>) at atmospheric pressure. The standard package size is 44 lb (20kg), smaller packs are available.

## ❖ Product Use

### • Dosage

The quantity of **Lupulin Pellets** in an addition can be calculated using the alpha acid content of the powder and an estimated or known utilization.

Late kettle additions of **Lupulin Pellets** (typically 5 – 20 min prior to the end of the boil) reduce alpha acid utilization but increase hop aroma and flavor.

### • Application

**Lupulin Pellets** can be added directly to the wort kettle or hop dosing vessel.

Dry hopping normally involves the addition of **Lupulin Pellets** during secondary fermentation or maturation using various techniques.

### • Storage

**Lupulin Pellets** should be stored at low temperatures (< 5 °C or < 41 °F). Pellets in opened foil packs should be used quickly to avoid deterioration of the bitter acids and essential oils.

### • Best Before Date

**Lupulin Pellets** are stable for five years from the date they were produced / packaged if stored under the recommended conditions.

### • Safety

When handling this product, it is advisable to wear a dust mask. **Lupulin Pellets** are combustible.

For full safety information, please refer to the relevant Hopsteiner® safety data sheet.

## ❖ Analytical Methods

### • Concentration of Bitter Substances

Alpha and beta acids can be measured using the following methods:

- HPLC according to Analytica-EBC 7.7 or ASBC Hops-14 with the current ICE standard
- spectrophotometric method according to ASBC Hops-6A

The lead conductance value can be measured using the following methods:

- Analytica-EBC 7.4 or 7.5
- ASBC Hops-6B

### • 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:

- copies of all relevant analytical procedures
- Safety Data Sheets (SDS)
- assistance with pilot or full-scale brewing trials
- special analytical services

Disclaimer: The information provided in this document is believed to be correct and valid. However, Hopsteiner® does not guarantee that the information provided here is complete or accurate and thus assumes no liability for any consequences resulting from its application.