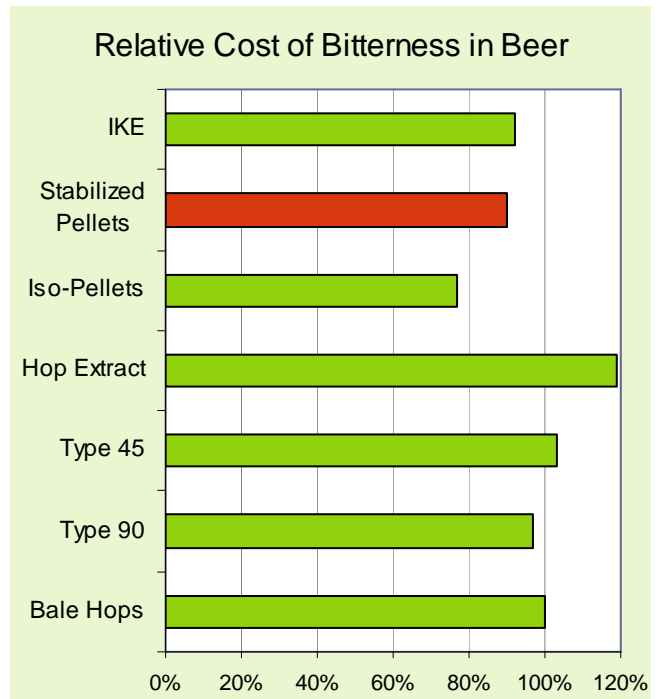


## Stabilized Pellets

### ❖ Overview

- **Stabilized Pellets** offer improvements in utilization of  $\alpha$ -acids due to the presence of excess  $Mg^{++}$  ions, added as  $MgO$  during processing.
- **Stabilized Pellets** can be produced as either Type 90 or Type 45 pellets.
- **Stabilized Pellets** can replace conventional alpha and aroma hop products without any change to beer quality.
- **Stabilized Pellets** show reduced loss of bittering potential compared to standard pellets after prolonged storage.



### ❖ Specification

- **Description:** Cylindrical pellets produced from whole hops which are dried, milled, blended with food grade  $MgO$ , pelletized and foil packed.
- **Consistency:** A solid which normally breaks up to a powder (variety dependent)
- **Color:** Typically dark green (depending on variety)
- **Alpha-acids:** Typically in the range 2 – 20 % (dependent upon hop variety)
- **Beta-acids:** Typically in the range 1 – 15 % (dependent upon hop variety)
- **Hop oils:** Typically 1 – 6 % of product but hop variety dependent
- **Moisture:** Typically 7 – 9 %

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## ❖ Properties

### □ Appearance

Green pellets, approximately 6 mm x 10 – 15 mm in size (diameter x length). Pellets should break apart readily upon opening the packs.

### □ Utilization

In normal use, **Stabilized Pellets** result in a utilization of around 38 – 45 %. This improved utilization, compared to standard pellets, is due to the Mg<sup>++</sup> ions catalyzing the rapid conversion of  $\alpha$ -acid to iso- $\alpha$ -acids.

### □ Flavor

Brewing trials demonstrate that beers of identical flavor can be produced when **Stabilized Pellets** are used as a direct replacement for standard pellets.

### □ Quality

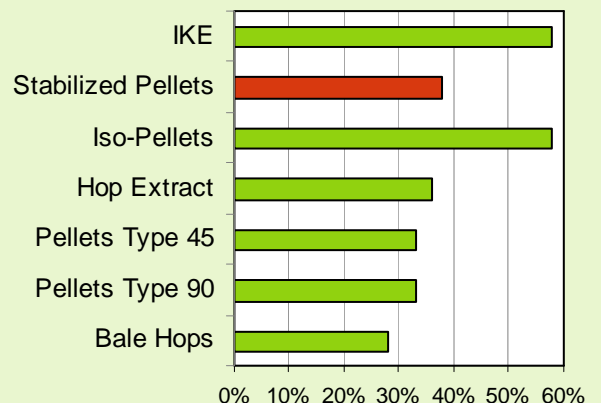
All Hopsteiner® products are produced in plants accredited to internationally accepted quality standards.

## ❖ Packaging

**Stabilized Pellets** are normally packed in laminated foils, within cartons, either as 'hard' packs under vacuum or as 'soft' packs under inert gas (CO<sub>2</sub> and / or N<sub>2</sub>) at atmospheric pressure.

Packaging sizes range from 2 kg (4.5 lbs) to 150 kg (330 lbs); normally 20 kgs (44 lbs) in the US.

Typical Utilization of Kettle Hop Products



## ❖ Product Use

**Stabilized Pellets** are used in similar ways to raw hops or regular pellets, contributing bitterness and hop character to beer. **Stabilized Pellets** can be added late in the boil, maximizing hop character whilst still achieving good utilization of hop bitter acids.

### □ Dosage

The quantity of pellets to be added can be calculated using the pellet  $\alpha$ -acid content and a utilization of 40 %. To establish the impact on beer aroma, trial or pilot brews are recommended as the quantity and quality of hop oil will vary between the hop varieties used.

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## □ Addition

Similarly to standard pellets, **Stabilized Pellets** can be manually weighed and added directly into the boiling wort.

**Stabilized Pellets** can be automatically dosed into the kettle.

## □ Storage

**Stabilized Pellets** should be cool stored at < 5°C (41°F). Opened foils/cartons should be used quickly to avoid deterioration of bitter acids and hop oil. It is essential to maintain **Stabilized Pellets** at a consistently cool temperature to avoid uncontrolled and uneven conversion of  $\alpha$ -acids to iso- $\alpha$ -acids.

## □ Best Before Date

**Stabilized Pellets** are stable 2 years from date of production under the recommended storage conditions.

## □ Safety

If dust is generated, it is advisable to wear dust masks. Hop pellets are a combustible material.

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

## ❖ Analytical Methods

### □ Concentrations of $\alpha$ -, $\beta$ - and pre-formed Iso- $\alpha$ -acids

Measured by HPLC using the EBC 7.8 method together with the current ICE & ICS standards; sample preparation according to EBC 7.5 or 7.7 methods.

Alternatively, ASBC Hops-15 may be used in conjunction with the additional step of calibration for  $\alpha$ - &  $\beta$ -acids using the current ICE standards.

### □ Concentrations of Hop oils

Hop oil concentration can be measured by either the IOB 6.3 or ASBC hops-13 methods.

## ❖ 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