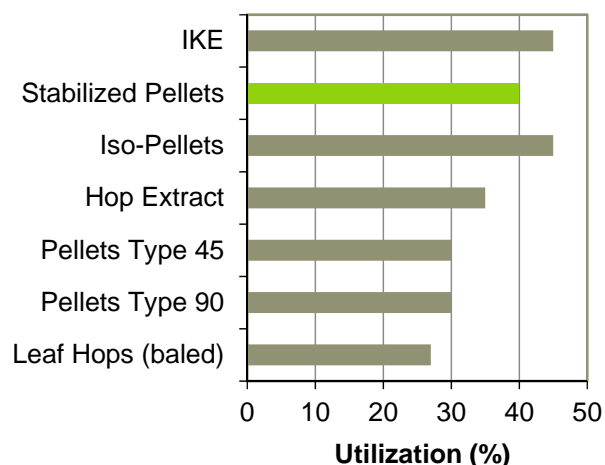


Stabilized Pellets (Type 90 and Type 45)

❖ Overview

- **Stabilized Pellets** are a hop product added to the wort kettle during the boiling process. They offer improved utilization of alpha acids due to the presence of excess Mg^{2+} ions added as MgO during processing.
- **Stabilized Pellets** can replace conventional hop products for bitterness and aroma without impacting beer quality.
- **Stabilized Pellets** exhibit fewer losses in bittering potential compared to standard pellets after prolonged storage.

Typical utilization of kettle hop products



❖ Specifications

- **Description:** cylindrical pellets made from dried, milled and pressed leaf hops; stabilized pellets are blended with food-grade MgO prior to pelletization
- **Color*:** dark green
- **Alpha acids*:** 1 – 25 %
- **Beta acids*:** 1 – 14 %
- **Hop oil*:** 0.2 – 7.0 ml/100g
- **Moisture content:** 7 – 9 %

*dependent on variety and crop year

❖ Properties

• Appearance

Stabilized Pellets are dark green pellets, approximately 6 mm x 10 – 15 mm in size (diameter x length).

• Standardization

The alpha acid content of **Type 45 Stabilized Pellets** can be standardized to specific concentrations during pellet production.

• Utilization

Given as an early kettle addition (up to 15 min after the boil begins), hop utilization normally falls within a range of 38 – 40 %. This higher utilization, compared to standard pellets, is due to the Mg⁺⁺ ions catalyzing the rapid conversion of alpha acids to iso-alpha acids. When **Stabilized Pellets** are added late in the boil, utilization can decline to 30 % or less, depending on individual process conditions. Both additions can vary depending on the desired intensity and the beer style.

• Flavor

Stabilized Pellets produce flavors in beer indistinguishable from those of regular pellets. **Stabilized Pellets** provide bitterness and aroma to the beer. The flavor depends on the variety, quantity and time of 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

Stabilized 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 (N₂ and/or CO₂) at atmospheric pressure. Pack sizes range from 5 kg (22 lb) to 18 kg (44 lb).

❖ Product Use

Stabilized Pellets are used in similar ways to standard pellets, contributing bitterness and hop aroma to beer.

• Dosage

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

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

• Addition

Stabilized Pellets can be added directly to the wort kettle or hop dosing vessel. Alternatively, owing to their free-flowing nature, additions of **Stabilized Pellets** can be automated. However, measures should be taken to avoid prolonged exposure to air in any bulk handling system.

• Storage

Stabilized 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**

Stabilized Pellets are stable for six 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. Hop pellets are combustible.

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

- ❖ **Analytical Methods**

- **Concentration of Bitter Substances**

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

- HPLC according to Analytica-EBC 7.7 or ASBC Hops-15 with the current ICE standard

- **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.