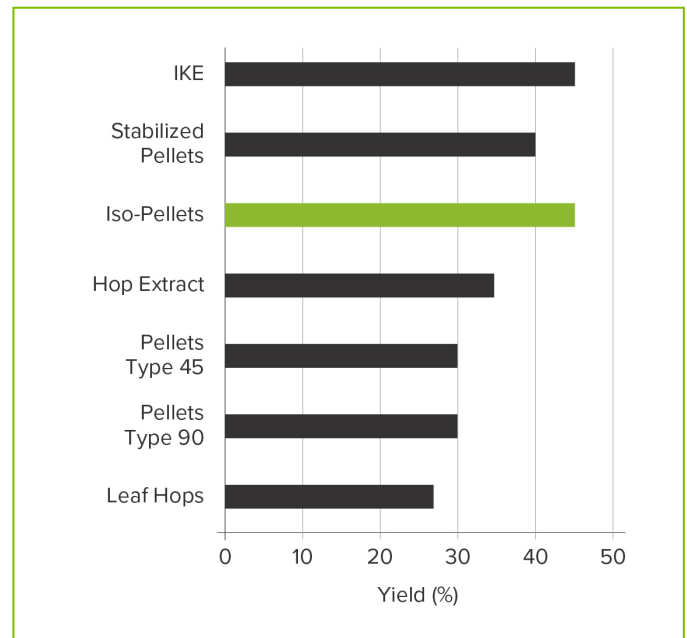


ISOMERIZED PELLETS (TYPE 90 & TYPE 45)

OVERVIEW

Iso-Pellets are a hop product made from leaf hops, added to the wort kettle during the boiling process. They offer a higher yield as a result of pre-isomerization of the alpha acids during the production process. Isomerization is induced by adding a small amount of food-grade MgO during processing followed by warm storage of the packaged pellets.

Iso-Pellets can replace conventional bittering and aroma products without impacting beer quality. Substantial cost savings are possible with pre-isomerized hop products. In addition, isomerized pellets have a long shelf life.



SPECIFICATIONS

Short description	cylindrical pellets; most of the alpha acids in these pellets have been converted to iso-alpha acids
Alpha acids	1 - 25 % (a minimum of 90 % of the original alpha acids are converted to iso-alpha acids)
Beta acids	1 - 14 %
Hop oils	0.2 - 7.0 ml/100 g
Moisture content	6 - 9 %

PROPERTIES

APPEARANCE

Iso-Pellets are dull green pellets, approximately 6 mm x 10 -15 mm in size (diameter x length). Iso-Pellets are slightly harder than standard pellets, but bulk pellets should break apart easily when the package is opened.

FLAVOR

Brewing trials comparing the two types of pellets and backed up by extensive practical experience, demonstrate that beers with identical flavor profiles can be produced when Iso-Pellets are used in place of standard pellets. The flavor depends on the variety, quantity and time of addition. For further information, please refer to the hop variety data sheets.

UTILIZATION

Utilization of Iso-Pellets (including late kettle additions) normally falls within a range of 45 -55 % as determined by HPLC.

STANDARDIZATION

The iso alpha acid content of Type 45 Iso-Pellets can be standardized to specific concentrations during pellet production.

QUALITY

All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards. A monitoring system for residues is in place.

PACKAGING

Our products are delivered in their respective recommended standard packaging. Alternatives may be possible upon customer request.

Standard packages of our processing plants in the USA (US) and Germany (DE) are:

- 5, 10, 90, 140 kg softpack under inert gas in 5-layer aluminum composite foils (DE)
- 20 kg soft pack under inert gas in 5-layer aluminum composite foils (US)

USAGE

DOSAGE

Iso-Pellets are used in similar ways to standard pellets, contributing bitterness and hop aroma to beer. The quantity of Iso-Pellets in an addition can be calculated using the iso-alpha acids content of the pellets and the assumption that utilization, due to pre-isomerization of the alpha acids, is likely to be approximately 50 % higher than that achieved with standard pellets. Late kettle additions of Iso-Pellets (typically 5 – 20 min prior to the end of the boil) result in the same utilization but increase hop aroma and flavor.

APPLICATION

Iso-Pellets can be added directly to the wort kettle or hop dosing vessel. Alternatively, owing to their free-flowing nature, additions of Iso-Pellets can be automated. However, measures should be taken to avoid prolonged exposure to air in any bulk handling system. A contact time of about 10 minutes in boiling wort is sufficient to achieve maximum utilization.

STORAGE

The recommended storage temperature in the original unopened packaging is < 5 °C (41 °F). Short-term, transport-related temperature deviations do not affect product quality.

BEST BEFORE DATE

Under the recommended storage conditions, the shelf life from the date of production/ packaging is at least 6 years.

SAFETY

Ensure good ventilation of the workplace and wear personal protective equipment. Avoid contact with eyes and skin. Do not inhale vapors or dusts. For full safety information, please refer to the relevant Hopsteiner® safety data sheet.

ANALYTICAL METHODS

International approved methods listed in committees such as ASBC or Analytica-EBC using current standards are applied.

PRODUCT ANALYTICS

Concentration of bitter substances

- Analytica-EBC 7.11 (HPLC)
- ASBC Hops-15 (HPLC)

Concentration of hop oils

- Analytica-EBC 7.10 (Distillation)
- ASBC Hops-13 (Distillation)

TECHNICAL SUPPORT

We are pleased to offer assistance and advice on:

- safety data sheets
- support for brewing trials on a pilot or commercial scale
- analytical services and information about analytical procedures

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.

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