HVG ISO-PELLETS

PRODUCT SPECIFICATION

MANUFACTURER

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SUPPLIER

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CUSTOMS TARIFF CODE

1210 20 90 (Hop cones, ground powdered or in the form of pellets (excl. with higher lupulin content))

MEANING OF CODE EXPLAINED BY EXAMPLE

- **32 DE 2020:**
  32 = N° of certification center according to "List of hop certification centers and their code numbers"; Article 24, Regulation (EC) No 1850/2006; DE: Germany; Harvest 2020
- **HHMG:** Origin = Hallertau; Variety = Hallertauer Magnum.
  Name of the variety according to the "List of world hop varieties of the International Hop Growers` Convention (IHGC)" in its current version
- **VA 20-263**: Production Year 2020; Batch number 263.
  With this printed code we guarantee that the product is fully traceable back to the farmer's leaf hops lots used for its production.

QUALITY AND FOOD SAFETY

- HVG e.G. is certified according DIN ISO 9001:2015 since the year 2000

- HACCP
- Hopfenveredlung St. Johann GmbH is certified according DIN ISO 9001:2015; DIN ISO 14001:2015, 22000:2005 and HACCP

PRODUCT PROPERTIES

HVG Iso-Pellets contain nearly all-natural substances of the female flower of the hop plant (Humulus Lupulus). Iso- alpha acids and the remaining unisomerized alpha acids are present in these products as magnesium salts. Except for the conversion of alpha acids to iso-alpha acids, Iso-Pellets have approximately the same composition as conventional pellets and are used in the same way.

The concentration of certain lower molecular weight polyphenols drops during the production process, which is apparently due to polymerization reactions. With respect to aroma compounds, changes in the highly volatile substances occur during the process, causing the aroma profile to be altered to a certain extent.

PHYSICAL-CHEMICAL DETAILS

Description	Unit	Value
Iso-α-acids (resins) --> Conversion rate alpha to iso- alpha > 90 %	% w/w*	2 – 22
β – acids (resins)	% w/w*	1 – 15
Essential oils	ml/ 100 g*	up to 4
Appearance	*	Dull green with a typical hop aroma
Specific weight	kg/ m^3	up to 600
Moisture	%	7 – 10

*depending on hop variety and crop year

PACKING AND DOSAGE

HVG Iso-Pellets are packed in aluminium laminated foils under inert atmosphere in corrugated cardboard cartons. To avoid damage of the foil during the Isomerization process our foils contain a pressure regulating valve. The foil size is 5,0 kg net pellets weight.

HEALTH AND SAFETY

Regarding HVG Iso-Pellets no special precautions are necessary. No hazardous reactivity known. Use protective mask where dust is generated. See MSDS.

PRODUCTION PROCESS AND PROCESS SPECIFICATIONS

Pelletized hops are made by milling whole hops and compressing the hops into pellets. Due to the addition of food-safe magnesium oxide as a catalyst and the thermal treatment of the final packaged product, alpha acids are isomerized to an extent of more than 90 % into iso-alpha-acids. The production process of Iso-Pellets is described in detail in the book:
Hops - Their Cultivation, Composition and Usage; publisher Hans Carl, 09/2014, ISBN: 978-3-418-00823-3.

PRODUCT USE

Because iso-alpha acids dissolve in the wort very quickly, Iso-Pellets can be added at any time during the process of wort boiling or even in the whirlpool. Iso-Pellets yield a bitterness approximately 1.5 times higher on average than normal pellets added early in the wort boiling process.
For further information please visit: www.hvg-germany.de

STORAGE / STABILITY

Out of quality reasons HVG Pellets should be used as soon as possible after opening the packaging. Hop constituents oxidize in contact with air, which leads e.g., to a deterioration of bitter acids and essential oils. Recommended stockholding period to reduce the loss of bittering constituents:

Temperature	Stability
At 10 – 15 °C (50 – 59 °F)	up to 2 years (in unopened, original packages)
At 0 – 5 °C (32 – 41 °F)	up to 5 years (in unopened, original packages)

Cardboard boxes may deteriorate in strength and become deformed due to factors in the storage location such as humidity, multilayer stacking, and storage duration. Note that the maximum number of cardboard boxes that may be stacked safely differs considerably depending on the storage conditions.

TRANSPORTATION

In order to guarantee the quality of the product until delivery at the brewery, preventive measures have to be implemented during transportation in order to avoid an exposure of HVG Pellets to temperatures exceeding 25 °C (77 °F) for more than 3 to 4 days. If this temperature requirement cannot be met, we strictly recommend to use a refrigerated container for overseas transportation with a temperature setting of about 4 °C (39 °F). High temperatures during a prolonged period of time may cause an inflation of the packaging due to a volume increase of the gases contained therein and may lead also to an inert degradation of the value-giving compounds of the hops. Under extreme exposure some foils may even break open exposing the hops to air leading to a total loss of value giving compounds.

ANALYTICAL METHODS

For HVG Iso-Pellets the following analysis methods can be applied:

Method	Usage
EBC 7.8	Iso- α -, α - and ß- acids in Hop and Isomerised Hop Extracts by HPLC
ASBC	Hops-15 (Iso- α -Acids in Isomerized Hop Pellets by HPLC
EBC 7.10 & ASBC Hops-13	Hop oil concentration
HSI (Hop storage index)	*

*is not applicable for describing the degree of aging in isomerized pellets, since the iso-alpha acids are detected spectrophotometrically along with alpha and beta acid degradation products. This yields an artificially high HSI value. For this reason, this analysis has no relevance for Iso-Pellets

OTHER INFORMATION

- The product is accompanied by the Phytosanitary Certificate, which states that the product has been produced according to the national health regulations.
- The above information is based on the current state of knowledge of our product at the time of publication and is furnished without warranty of any kind.
- The user must satisfy himself that the product is entirely suitable for his purposes.