BarthHaas®

Hexahop Gold®

Characteristics

Hexahop Gold® is an aqueous solution, standardised to 10% w/w, comprising a mixture of hexahydro-iso-α-acids and tetrahydro-iso-α-acids produced from CO_2 hop extract using a patented, all-aqueous process. Hexahop Gold® improves foam stand and cling and can be used for light-stable hopping in beers that will be packaged in green or clear glass. Hexahop Gold® imparts clean, smooth bitterness and is especially effective when used to develop low BU beers. Hexahop Gold® will also act as an antimicrobial agent when added to beer. Hexahop Gold® is classified as a modified hop extract which may be safely used in beer in accordance with US FDA regulation 21 CFR 172.560(b) (6) (7).

Product Specifications

Description:	A yellow to amber colored, aqueous solution of the potassium salts of tetrahydro-iso-α-acids and hexahydro-iso-α-acids
Concentration:	Standard concentration is 10.0% ± 0.5 of a 50:50 mixture of tetrahydro-iso-α-acids and hexahydro-iso-α-acids by HPLC.
pH:	8.5 – 11.0
Density:	1.020 g/mL (approximately) at 20 °C (68 °F)
Solubility:	Soluble in pH-adjusted de-mineralised water, and in alcohol
Iso-α-acids:	< 0.1%

Quality and Food Safety

Barth-Haas maintains quality management systems registered to the ISO 9001 standard, as well as food safety management programs based on internationally recognised (HACCP) principles. Please refer to our web site (www.barthhaas.com) for more information on our systems and programs.

Product Use

Hexahop Gold® is normally used after fermentation and before final filtration. Utilisation of Hexahop Gold® in final beer can be expected between 55 - 80% depending on the time and efficiency of dosing (kettle dosing is not advisable, as utilisation can decrease considerably). The point of addition should be close to a region of turbulent flow, e.g. on the suction side of a centrifugal pump. The dosing pump should be adjusted to deliver the Hexahop Gold® over approx. 70% of the total transfer time. It is advisable to make the addition prior to the final filtration step. Local high concentrations of hexa/tetrahydro-iso-α-acids should be avoided and the addition point should be well separated from that of other beer additions. Hexahop Gold® may be added at ambient temperature without prior dilution directly to beer. If dilution is necessary, the use of de-mineralised water with a pH adjustment to 10 – 11 (with KOH) is necessary. Do not use sodium bases to adjust the pH of de-mineralised water – caustic soda or sodium hydroxide form poorly soluble salts with most hop acids.

The amount of Hexahop Gold® is calculated based on the hop product concentration and the assumed utilisation. Conducting trials at the brewery will determine the correct dosage of Hexahop Gold® with regard to sensory bitterness and foam enhancement. Depending on the type of beer, Hexahop Gold® may give 1.0 - 1.3 times the perceived bitterness of normal iso-α-acids. Hexahop Gold® should not be left in dosing lines at low temperatures and we recommend cleaning dosing lines with warm, slightly alkaline de-mineralised water or ethanol after use.

Usage Calculations

The following calculations are based on the assumption that the mixture of hexahydro-iso-α-acids and of tetrahydro-iso-α-acids is 1.3 times as bitter as iso-α-acids (IAA). Utilisation of hexahydro-iso-α-acids (HHIAA) can be expected to be about 70% or higher when Hexahop Gold® is used as recommended.

$$\textbf{Desired Sensory Bitterness Units} = \textbf{BU}$$

$$\textbf{hexa/tetrapurerequired in beer(mg/L)} = \frac{\textbf{BU}}{\textbf{1.3}}\ (\textbf{1.3}\ \boldsymbol{assumes\ sensory\ bitterness\ relative\ to\ IAA})$$

$$\textbf{Dosage hexa/tetrapure in mg/L}\ (\textbf{70\%}\ \boldsymbol{utilisationassumed}) = \frac{\textbf{BU}}{\textbf{1.3}} \times \frac{\textbf{100}}{\textbf{70}}$$

$$\textbf{Dosage in grams hexa/tetra per hL of beer} = \rightleftarrows \frac{\textbf{BU}}{\textbf{1.3}} \times \frac{\textbf{100}}{\textbf{70}} \times \frac{\textbf{100}}{\textbf{1000}}$$

Amount of Hexahop Gold® (10% soln) ing/hL :

$$\frac{\textbf{BU}}{\textbf{1.3}} \times \frac{\textbf{100}}{\textbf{70}} \times \frac{\textbf{100}}{\textbf{1000}} \times \frac{\textbf{100}}{\textbf{10}}\ \textbf{g/hL} = \textbf{BU} \times\ \textbf{1.10g/hL}$$

Amount of Hexahop Gold® (10% soln) in mL/hL:

$$\frac{\textbf{BU}}{\textbf{1.3}} \times \frac{\textbf{100}}{\textbf{70}} \times \frac{\textbf{100}}{\textbf{1000}} \times \frac{\textbf{100}}{\textbf{10}} \times \frac{\textbf{1}}{\textbf{1.020}}\ \textbf{mL/hL} = \textbf{BU} \times \textbf{1.08mL/hL}$$

*(e. g. for **5** desired sensory bitterness units 5/1.3 X 100/70 X 100/1000 X 100/10 = **5.5** g/hL (**5.4** mL/hL) are necessary)*

Foam Enhancement

Calculate required Hexahop Gold® as shown above for final hexa/tetra pure hop acids concentration to typically be between 2 and 5 mg/L for foam enhancement. We recommend that the final concentration of hexa/tetra hop acids not be more than 5 mg/L to prevent excessive foaming effects.

Reduce alternative bittering contribution (kettle or other products) by equivalent BU to compensate for the bitterness of Hexahop Gold®.

Light Stability

Hexahop Gold® will only provide protection from light-struck flavour if a complete absence of normal iso-α-acids is achieved, therefore no other sources of non-reduced iso-α-acids should exist in the wort or beer streams. Thus for light-stable beers packaged in clear or green glass bottles, all the hop bitterness must be derived from reduced hop acids such as Tetrahop Gold®, Redihop® or Hexahop® products. Iso-α-acids (from equipment or yeast) must not be present in the beer. If beta extracts are used as kettle additives, ensure that the concentration of α-acids and iso-α-acids are below 0.2%

Packaging

Hexahop Gold® is normally supplied in high-density polythene containers of 20 kg.

Storage and best-by Recommendation

Store Hexahop Gold® in full, closed containers at 15 – 25 °C (59 – 77 °F). Prolonged storage at high temperature can cause deterioration. Hexahop Gold® performs best if used within 24 months from the time of production if stored as recommended. Opened containers should be used within a few days.

Analytical Methods

The concentration of hexa- and tetrahydro-iso-α-acids is measured by UV Spectrophotometry (with modified formula factors) or by the EBC Method 7.9 (HPLC). Details of recommended methods are available on request.

Safety

Safety Data Sheet (SDS) is available on our website at www.barthhaas.com.

Technical Support

We will be pleased to offer help and advice on the use of Hexahop Gold® in brewing.

E-Mail: Brewingsolutions@barthhaas.de