



# Hexahop® 95

## CHARACTERISTICS

Hexahop® 95 is an aqueous solution, standardized to 20% w/w, of hexahydro-iso- $\alpha$ -acids produced from CO<sub>2</sub> hop extract using a patented, all-aqueous process. Hexahop® 95 is a hop extract that improves beer foam stand and cling and can be used for light-stable hopping in beers that will be packaged in green or clear glass. Hexahop® 95 imparts a clean and smooth bitterness and is especially effective when used to develop low bitterness units (BU) beers. Hexahop® 95 will also act as an antimicrobial agent when added to beer. Hexahop® 95 is classified by the U.S. FDA as a modified hop extract which may be safely used in beer in accordance with regulation 21CFR 172.560(b) (6) (7).

## PRODUCT SPECIFICATIONS

|                                      |  |
|--------------------------------------|--|
| <b>Description</b>                   | An amber colored, aqueous solution of the potassium salts of hexahydro-iso- $\alpha$ -acids  |
| <b>Concentration</b>                 | Standard concentration is 20.0% $\pm$ 0.5 of a 95:5 mixture of hexahydro-iso- $\alpha$ -acids (95%) and tetrahydro-iso- $\alpha$ -acids (5%) by HPLC |
| <b>pH</b>                            | 8.5 - 10.0   |
| <b>Viscosity</b>                     | 2 -15 mPas at 20 °C (68 °F)  |
| <b>Density</b>                       | 1.040 g/mL (approximately) at 20 °C (68 °F)  |
| <b>Iso-<math>\alpha</math>-acids</b> | < 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 recognized (HACCP) principles. Please refer to our web site ([www.barthhaas.com](http://www.barthhaas.com)) for more information on our systems and programs.



## PRODUCT USE

Hexahop® 95 is normally used after fermentation and before final filtration. Utilization of Hexahop® 95 in final beer can be expected between 55-80% depending on the time and efficiency of dosing (Kettle dosing is not advisable, as utilization can decrease considerably). The point of addition should be close to a region of turbulent beer flow, e.g. on the suction side of a centrifugal pump. The dosing pump should be adjusted to deliver the Hexahop® 95 over approximately 70% of the total transfer time. It is advisable to make the addition prior to the final filtration step. Local high concentrations of hexahydro-iso- $\alpha$ -acids should be avoided in the beer and the addition point should be well separated from that of other additions. Hexahop® 95 may be added at ambient temperature without prior dilution directly to beer. If dilution is necessary, the use of de-mineralized water with a pH adjustment to 10 - 11 (with KOH) is necessary. Do not use sodium bases to adjust the pH of deionized water - caustic soda or sodium hydroxide form poorly soluble salts with most hop acids.

The amount of Hexahop® 95 for dosing is calculated based on the product concentration and the assumed utilization. Conducting trials at the brewery will determine the correct dosage of Hexahop® 95 in regard to sensory bitterness and foam enhancement. Depending on the type of beer, Hexahop® 95 may give 1.0 to 1.1 times the perceived bitterness of normal iso- $\alpha$ -acids. Hexahop® 95 should not be left in dosing lines at low temperatures and we recommend cleaning the dosing lines and pumps with warm, slightly alkaline de-mineralized water or ethanol after use.

## USAGE CALCULATIONS

The following calculations are based on the assumption that hexahydro-iso- $\alpha$ -acids are 1.1 times as bitter as iso- $\alpha$ -acids (IAA). Utilization of hexahydro-iso- $\alpha$ -acids is likely to be about 70% or more when Hexahop® 95 is used as recommended.

$$\text{Desired Sensory BitternessUnits} = \text{BU}(95\% \text{Hexa}/5\% \text{Tetra combination described as "Hexa"})$$

$$\text{Hexa pure required in beer} = \frac{\text{BU}}{1.1} \quad (1.1 \text{ assumes sensory bitterness relative to IAA})$$

$$\text{Dosage hexa pure in mg/L (70\% utilisation assumed)} = \frac{\text{BU}}{1.1} \times \frac{100}{70}$$

$$\text{Dosage in grams hexa pure per hL of beer} = \frac{\text{BU}}{1.1} \times \frac{100}{70} \times \frac{100}{1000}$$

$$\text{Dosage Amount of Hexahop® 95 (20\% soln) in g/hl :}$$

$$\frac{\text{BU}}{1.1} \times \frac{100}{70} \times \frac{100}{1000} \times \frac{100}{20} = \text{BU} \times 0.65 \text{g/hl}$$

$$\text{Amount of Hexahop® 95 (20\% soln) in ml/hl:}$$

$$\frac{\text{BU}}{1.1} \times \frac{100}{70} \times \frac{100}{1000} \times \frac{100}{20} \times \frac{1}{1.04} \text{ ml/hl} = \text{BU} \times 0.62 \text{ml/hl}$$

(e. g. for 5 desired sensory bitterness units  $5/1.1 \times 100/70 \times 100/1000 \times 100/20 = 3.3 \text{ g/hL}$  (3.1 mL/hL) are necessary)

## FOAM ENHANCEMENT

Calculate required Hexahop® 95 as shown above (generally we recommend Hexahop® products not be added for the final beer to contain more than 5 ppm pure tetra and/or hexa). Reduce kettle or other hop product bittering by equivalent "hexa BU" to compensate for the bitterness contribution of Hexahop® 95.



## LIGHT STABILITY

Hexahop® 95 will only provide protection from light-struck flavour if a complete absence of normal iso- $\alpha$ -acids is achieved, therefore no other sources of non-reduced iso- $\alpha$ -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- $\alpha$ -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  $\alpha$ -acids and iso- $\alpha$ -acids are below 0.2%

## PACKAGING

Normally available in high density polythene containers of 20 kg.

## STORAGE AND BEST-BY RECOMMENDATION

Store Hexahop® 95 in full, closed containers at 15 – 25 °C (59 – 77 °F). Prolonged storage at high temperature can cause deterioration. Hexahop® 95 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 hexahydro- and tetrahydro-iso- $\alpha$ -acids is measured by UV Spectrophotometry (with modified 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](http://www.barthhaas.com).

## TECHNICAL SUPPORT

We will be pleased to offer help and advice on the use of Hexahop® 95 in brewing

E-Mail: [Brewingsolutions@barthhaas.de](mailto:Brewingsolutions@barthhaas.de)