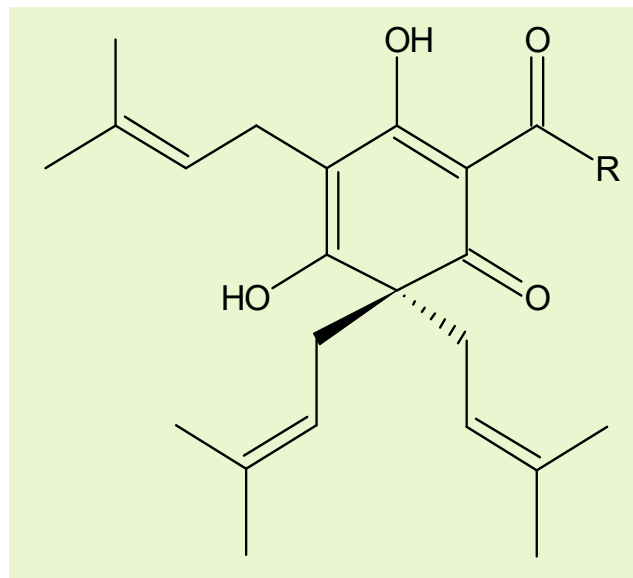


## BetaBio 45%

### ❖ Overview

- **BetaBio 45%** is produced from CO<sub>2</sub> extract of hops. It contains predominantly the natural beta acids fraction of hops extract dissolved in food grade Propylene Glycol.
- Beta acids are well-known to have potent anti-microbial properties and are particularly active against Gram positive bacteria and certain algae.
- **BetaBio 45%** is typically added to molasses based feed stocks for the production of yeast or alcohol at a 5 ppm dose rate.

Structure of Beta acids



R = -CH-(CH<sub>3</sub>)<sub>2</sub> (Colupulone)  
 R = -CH<sub>2</sub>-CH-(CH<sub>3</sub>)<sub>2</sub> (Lupulone)  
 R = -CH(CH<sub>3</sub>)-CH<sub>2</sub>-CH<sub>3</sub> (Adlupulone)

### ❖ Specification

- Description: A dark brown liquid containing the potassium salts of hop beta acids
- Beta acids: 45% (± 2.0)
- Alpha acids: 0.4 % (± 0.3)
- Hop oils: 1.5 % (± 0.5)
- Propylene Glycol: 20 % (± 15)
- Moisture: < 8%
- pH in water: 11.0 (± 0.5) (1 pt product : 3.5 pts water)
- Viscosity: 300 mPas (at 20°C / 68 °F)
- Density: 1.070 (± 0.010) g / ml at 20°C / 68 °F

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## ❖ Properties

### • Appearance

A clear brown liquid at room temperature, becoming more mobile when heated. Remains fluid even at 0°C.

### • Organoleptic Properties

Pleasant floral aroma. Bitter taste with floral overtones when diluted 1000 x into water.

### • Stability

When stored in the original unopened containers **BetaBio 45 %** is very stable. Use any opened container as soon as possible.

### • Quality

All Hopsteiner® products are produced in plants accredited to internationally accepted quality standards. **BetaBio 45%** is certified as Kosher, including for Passover, GRAS, Food Grade and is not an antibiotic.

## ❖ Packaging

**BetaBio 45 %** is regularly available in 20 kilo pails (HDPE) or 200 kilo drums (PP). Other pack sizes (including totes) are available on request.

## ❖ Product Use

We recommend that **BetaBio 45 %** be used in its undiluted form. It is not difficult to pump and is compatible with the usual materials used in food processing plants.

### • Dosage

Actual dosage will depend on the application, but typically 5-10 ppm of **BetaBio 45 %** is effective as an antibacterial agent.

### • Addition

**BetaBio 45 %** may be dosed directly into process streams or added to solid or semi-solid products in a suitable blender. When dosing into pipelines or vessels it is best to ensure that there is vigorous mixing to disperse the product quickly. This can be achieved by injecting into the bulk fluid at high pressure through a suitable nozzle or small bore pipe so that a high degree of turbulence is generated.

### • Storage

**BetaBio 45 %** has excellent storage stability and may be kept for at least one year at ambient temperature in unopened, original containers. Bulk storage in heated tanks (up to 40°C) is also possible, provided the product is not directly exposed to air and used within about 3 months.

### • Safety

**BetaBio 45 %** should be handled with due care, especially to prevent contact with the eyes. Any contamination of the skin should be washed off with soap and water. If **BetaBio 45 %** gets into the eyes, irrigate with excess water until clear and seek immediate medical attention.

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

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## ❖ Supplementary Information

### • Beta acids

Beta acids are natural, major constituents of hops and are present in amounts ranging from about 2 – 12 % according to variety. They are soluble in organic solvents and are readily extracted by liquid or supercritical carbon dioxide. CO<sub>2</sub> extracts produced commercially for use in brewing typically contain from 15 – 35 % beta acids, of which there are three major homologs - colupulone, lupulone and adlupulone. All three are active as anti-bacterial agents.

## ❖ Analytical Methods

### • Concentration of Bitter Substances

Beta acids (as well as alpha acids) can be measured using the following methods:

- HPLC according to Analytica-EBC 7.8 with the current ICE standard
- UV spectrophotometric analysis acc. to ASBC Hops-14

## ❖ 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