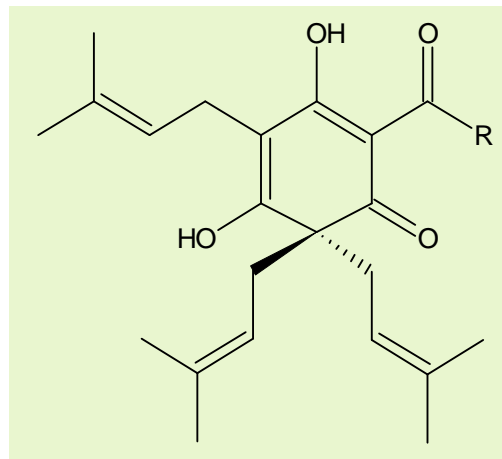


## Beta Bio 45 %

### ❖ Overview

- **Beta Bio 45 %** is produced from CO<sub>2</sub> extract of hops. It contains predominantly the natural β-acids fraction of hops extract dissolved in food grade Propylene Glycol.
- β-acids are well-known to have potent anti-microbial properties, and are particularly active against Gram positive bacteria and certain algae.
- Potential uses for **Beta Bio 45 %** include suppression of bacterial growth in sugar-rich media and as a protective agent for uncooked poultry products.
- Both Hops Extract and Propylene Glycol are classified as GRAS



Structure of β-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 brown, clear solution containing the potassium salts of hop β-acids.
- **Beta-acids:** 45 ± 2.0 % by HPLC
- **Propylene Glycol:** 50 ± 5 %
- **Moisture:** < 8 %
- **Density (at 20°C):** 1.07 ± 0.01 g/ml
- **Viscosity (at 20°C):** typically about 300 cP
- **pH in Water:** 10.7 ± 0.5 (1 pt product: 3.5 pts water)

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## ❖ Properties

### □ Appearance

A clear or slightly hazy, brown, viscous 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.

### □ Quality

All Hopsteiner® products are produced in plants accredited to internationally accepted quality standards.

## ❖ Packaging

**Beta Bio 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 **Beta Bio 45 %** always 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 the  $\beta$ -acids are effective as anti-microbial agents in the range 2 – 50 ppm. Hence the normal dose rate for **Beta Bio 45 %** would be in the range 7 – 167 ppm.

### □ Application

**Beta Bio 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 so as 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

**Beta Bio 45 %** has excellent storage stability at temperatures below 25°C (77°F) 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.

### □ Best Before

**Beta Bio 45 %** is stable 2 years from date of production.

### □ Safety

**Beta Bio 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 **Beta Bio 45 %** gets into the eyes, irrigate with excess water until clear and seek immediate medical attention.

For full safety information please see the relevant Steiner material 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-microbial agents.

### ❑ Propylene Glycol

Propylene glycol (1,2-propanediol) is regarded as a very safe material and is widely used as a carrier for food ingredients. It is permitted for use in foodstuffs at levels not to exceed good manufacturing practice. Under FDA regulations it is specifically permitted at up to 2.5 % in frozen dairy products, 5 % in alcoholic beverages, 24 % in confections and frostings and 97 % in seasonings. At high concentrations it has a sweet taste.

## ❖ Analytical Method

The active ingredients content of **Beta Bio 45 %** may be assessed by either of the following methods:

- ❑  $\beta$ -acids - by HPLC using the current hops extract ICE standard according to the ASBC Hops-14 or EBC 7.8 methods.\*

\*ICE = International Calibration Extract  
ASBC = American Society of Brewing Chemists  
EBC = European Brewery Convention

## ❖ Technical Support

We will be pleased to offer help and advice on the full range of Hopsteiner® products:

- ❑ Copies of all relevant analytical procedures
- ❑ Material Safety Data Sheets (MSDS)
- ❑ Assistance with pilot scale trials
- ❑ Specialist analytical services

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