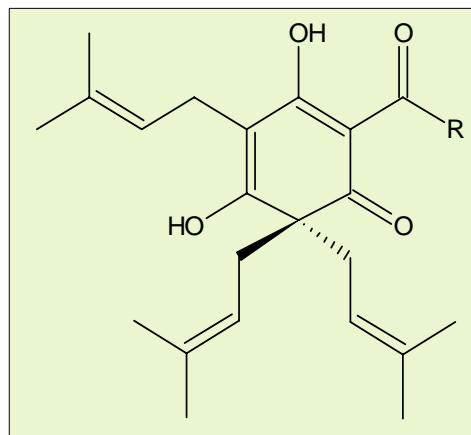


## Beta Bio 45%

### ❖ Overview

- **Beta Bio 45%** is produced from CO<sub>2</sub> hop extract. It contains the natural β-acids fraction of hops formulated in alkaline propylene glycol.
- β-acids are the most antibacterial compound found in hops. Less than 2 ppm of Beta Bio 45% can inhibit the growth of most gram positive bacteria in laboratory testing. Beta acids have also been shown to inhibit the growth of certain algae at ~ 20 ppm.
- Both Hops Extract and Beta Acids are classified as GRAS.
- Beta Bio 45% is typically added to molasses based feed stocks for the production of yeast or alcohol at a 5 ppm dose rate.



### 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 ± 1.0% by HPLC
- **Density (at 20°C):** 1.07 ± 0.01 g/ml
- **Viscosity (at 20°C):** typically about 300 cP
- **pH in Water:** 10.0 ± 0.5

## ❖ 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 **Beta Bio 45%** is very stable. Use any opened containers as soon as possible.

### □ Quality:

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

## ❖ Packaging

**Beta Bio 45%** is regularly available in 20-kg pails (HDPE) or 200-kg drums (PP). Other package sizes (including totes) are available on request.

## ❖ Product Use

We recommend that **Beta Bio 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 **Beta Bio 45%** is effective as an anti-bacterial agent.

### □ 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 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:

**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.

## ❖ Supplementary Information

### □ Beta-acids

$\beta$ -acids are a natural major constituent of hops and are present in amounts ranging from about 2 – 12% depending on the variety. They are soluble in organic solvents and are readily extracted by liquid or supercritical carbon dioxide. CO<sub>2</sub> hop extract produced commercially for use in brewing beer 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.

**Beta Bio 45%** is certified as Kosher, including for Passover, GRAS, Food Grade and is not an antibiotic.

### ❖ Analytical Method

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

β-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 or commercial trials
- ❑ Specialist analytical services

Rev. 8.17.09