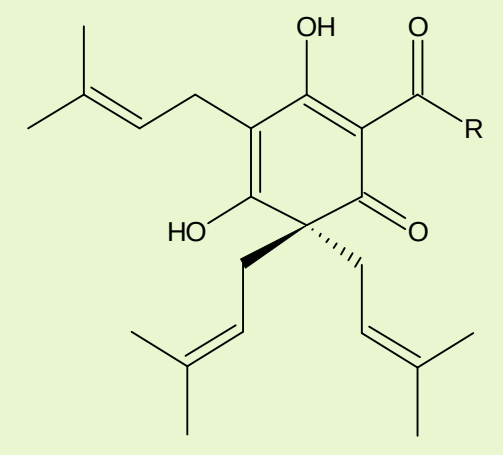
Beta Bio 45 %

❖ Overview

- **Beta Bio 45 %** is produced from CO_2 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.
- **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-$(CH_3)_2$	(Colupulone)
R = -CH_2-CH-$(CH_3)_2$	(Lupulone)
R = -CH(CH_3)-CH_2–CH_3	(Adlupulone)

❖ Specification

- **Description:** A brown, clear solution containing the potassium salts of hop β-acids
- **Beta-acids:** 45 ± 1.5% (w/w) by HPLC
- **Density (at 20°C):** 1.07 (± 0.01) g/ml
- **Viscosity (at 20°C):** typically about 300 cP
- **pH:** 11.0 ± 0.5 (1 pt product: 3.5 pts water)

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

❖ 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 antibacterial 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.

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❖ Supplementary Information

❑ Beta-acids

β-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_2 hop extract produced commercially for use in brewing beer typically contain from 15 – 35 % β-acids, of which there are three major homologs – colupulone, lupulone and adlupulone. All three are active as anti-bacterial agents.

❖ 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

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