

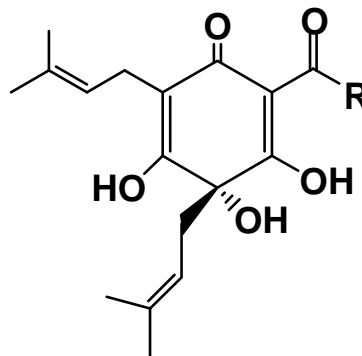
Alpha Bio

❖ Overview

- **Alpha Bio** is a natural antibacterial product produced from CO₂ hop extract. Alpha Bio contains natural hop Alpha acids formulated in alkaline water.
- Alpha acids are unique to hops and naturally inhibit the growth of gram positive bacteria, such as Lactobacillus. Approximately 20 ppm of **Alpha Bio** can inhibit the growth of most gram positive bacteria under ideal conditions.
- **Alpha Bio** is food grade, kosher and not an antibiotic.

❖ Specification

- **Description:** A clear yellow to amber solution containing the potassium salts of hop Alpha acids.
- **Alpha Acids:** 20 ± 1.0% by HPLC
- **Density (at 20°C):** 1.05 ± 0.02 g/ml
- **pH in Water:** 8.5 ± 0.5



Structure of Alpha Acids

- R = -CH-(CH₃)₂ (Cohumulone)
 R = -CH₂-CH-(CH₃)₂ (Humulone)
 R = -CH(CH₃)-CH₂-CH₃ (Adhumulone)

❖ Properties

□ Appearance:

A clear yellow to amber liquid at room temperature.

□ Stability:

In its acid form, alpha acids are very stable. However, the user friendly potassium salt form of this product should be stored cold (below 10 °C) to insure no loss in alpha acid concentration. If stored at room temperature, approximately 0.25% of the alpha acids will be lost. 12 month storage at 20 °C will result in an absolute 17% Alpha acid concentration. Use any opened containers as soon as possible.

□ Quality:

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

❖ Packaging

Alpha Bio is 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 **Alpha Bio** 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 20-100 ppm of **Alpha Bio** is effective as an anti-bacterial agent.

□ Application:

Alpha Bio 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:

Alpha Bio should be stored refrigerated, 2-10 °C in its original unopened container prior to use. **Alpha Bio's** activity will drop approximately 0.25% per month when stored at room temperature resulting in an absolute product activity of 17% Alpha Acids after 12 months.

□ Safety:

Alpha Bio 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 **Alpha Bio** 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

□ Alpha Acids

Alpha acids are a natural major constituent of hops and are present in amounts ranging from about 2 – 20% depending on hop the variety. Alpha acids are soluble in organic solvents and are readily extracted by liquid or



supercritical carbon dioxide. CO₂ hop extract produced commercially for use in brewing beer typically contain from 40-70% Alpha acids, of which there are three major homologs – cohumulone, humulone and adhumulone. All three are active as anti-bacterial agents.

Alpha Bio is certified as Kosher, including for Passover, GRAS, Food Grade and is not an antibiotic.

❖ Analytical Method

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

Alpha 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. 01-20-2012