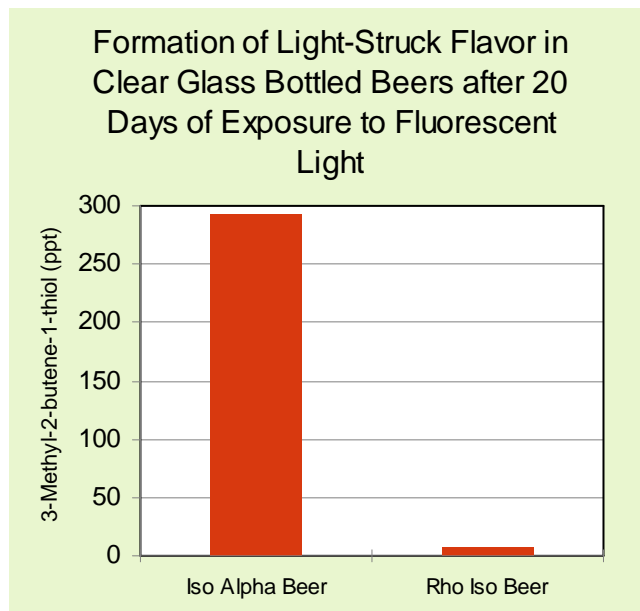


## Rho-Iso-Extract – 35 %

### ❖ Overview

- **Rho – 35 %** is a pure, aqueous solution of the potassium salts of reduced (*rho*) iso- $\alpha$ -acids produced entirely from CO<sub>2</sub> Extract.
- **Rho – 35 %** gives full protection from light-struck flavor when used as the complete source for hop-derived bittering or in conjunction with other reduced hop products.
- **Rho – 35 %** will give a slight enhancement to beer foam stability compared to an otherwise similar beer bittered in a conventional fashion.



### ❖ Specification

- **Description:** A reddish-brown, aqueous solution of reduced (*rho*) iso- $\alpha$ -acids in potassium salts form.
- **Concentration:** 35 ± 1.0 % (w/w) of *rho*-iso- $\alpha$ -acids by UV Spectrophotometric analysis or corresponding HPLC value.
- **Iso-alpha-acids** Less than 0.2 % by HPLC
- **Alpha-acids:** Absent (< 0.1 % by HPLC)
- **Beta-acids:** Less than 0.3 % by HPLC
- **Hop oils:** Less than 0.5 %
- **pH:** 8.5 (± 0.5)
- **Density:** 1.075 (± 0.005) g/ml

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## ❖ Properties

### □ Appearance

A reddish brown, mobile fluid; a redissolvable precipitate may form during normal storage.

### □ Utilization

When added to conditioned beer prior to final filtration, the utilization of the reduced iso-alpha-acids is typically around 70 %. Used as a kettle additive, the observed utilization is likely to fall to around 50 %.

### □ Flavor

**Rho** provides only bitterness. Many brewers consider that **Rho** imparts a particularly pleasant, “soft” bitterness to the beer.

### □ Quality

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

## ❖ Packaging

**Rho** is normally supplied in 20 kg (45 lbs) net wt. plastic pails.

## ❖ Product Use

Typically used as a post fermentation addition to unhopped beer. However, since a relatively high utilisation can often be achieved by addition to the kettle, some brewers prefer instead to make a partial or even complete addition to the wort, thereby reducing the chances of encountering bacterial infections.

### □ Dosage

Determination of the dosing rate is of course based on the anticipated utilisation but must also take account of the fact that reduced (rho) iso- $\alpha$ -acids are inherently about 30 % less bitter than are normal iso- $\alpha$ -acids. Actual utilization will vary from brewery to brewery depending on plant and process conditions.

### □ Addition

For post fermentation addition, **Rho** should first be heated to c. 50°C (120°F) or a little above and then agitated to ensure dissolution of any precipitated material before use. We recommend that the clear solution be then injected directly and vigorously into a beer main, preferably after primary filtration and any gravity adjustment, but before final clarification. The injection should take place over at least 70 % of the volume being transferred.

### □ For Light Stable Beer

It is essential that no other sources of non-reduced iso- $\alpha$ -acids be inadvertently introduced into the wort or beer. Therefore it is essential to:

- Avoid contamination from equipment surfaces that have been in contact with normal iso- $\alpha$ -acids.
- Never pitch wort with yeast that has been in contact with normal  $\alpha$ - or iso- $\alpha$ -acids.
- If beta extracts are used as kettle additives ensure that the concentration of  $\alpha$ - and iso- $\alpha$  acids are < 0.1 %.

## ❑ Storage

**Rho** should be stored in sealed containers at 10° – 25°C (50° – 77°F). Opened containers should be used up within a few days.

## ❑ Best Before Date

**Rho** is stable 2 years from date of production.

## ❑ Safety

**Rho** is a slightly alkaline, intensely bitter substance but may be safely handled using routine precautions to avoid contact with skin and, particularly, eyes. Any material coming into contact with the skin should be washed off with soap and water. If **Rho** gets into the eyes, irrigate with excess water until clear and seek medical attention.

For full safety information please see the relevant Steiner material safety data sheet.

## ❖ Analytical Methods

### ❑ Concentration of Reduced (*rho*) Iso- $\alpha$ -acids:

The concentration of reduced (*rho*) iso- $\alpha$ -acids is measured by UV Spectrophotometry.

Analysis by HPLC, using the current ICS standard according to the modified EBC 7.9 method, is also possible. Details of recommended methods are available on request.

## ❖ 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 full brewery trials
- ❑ Specialist analytical services

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