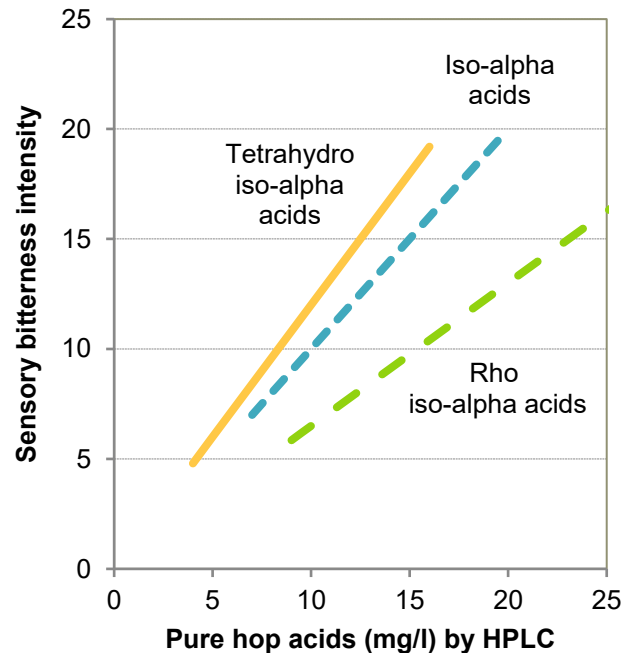


RHO-S 30 %

❖ Overview

- **RHO-S 30 %** is a pure glycerine solution of the potassium salts of rho iso-alpha acids derived exclusively from CO₂ hop extract.
- **RHO-S 30 %** provides protection against lightstruck flavor when used as the sole source for bitterness or in combination with other light stable hop products.
- Compared to regular iso-alpha acids, **RHO-S 30 %** imparts a smoother, non-lingering bitterness.
- **RHO-S 30 %** has an improved physical storage stability due to the dilution in glycerine. Even freezing during transport will not damage the product.

Comparison of sensory and analytical bitterness



❖ Specifications

- Description: reddish-brown solution of the potassium salts of rho iso-alpha acids in glycerine
- Concentration: 30.0 ± 1.0 % (w/w) of rho iso-alpha acids by HPLC
- Iso-alpha acids: below detection limit
- Alpha acids: below detection limit
- pH: 8.5 (± 0.5)
- Viscosity: < 3000 mPas at 20 °C (68 °F); batch dependant
- Density: 1.205 (± 0.05) g/ml at 20 °C (68 °F)

❖ Properties

• Appearance

At room temperature, **RHO-S 30 %** is a slightly viscous liquid that is reddish-brown to amber in color. **RHO-S 30 %** is miscible in demineralized water and alcohol.

• Utilization

When added to conditioned beer prior to the final step in filtration, utilization of rho iso-alpha acids is typically 70 – 85 %. If added to the wort kettle, utilization is likely to be around 45 – 55 %.

Actual utilization will vary from brewery to brewery due to differences in equipment and process conditions.

• Light Stability

RHO-S 30 % only provides protection against lightstruck flavor in the complete absence of alpha acids and iso-alpha acids.

RHO-S 30 % can be used in conjunction with any Hopsteiner® light stable product to achieve light stability.

• Flavor

RHO-S 30 % only imparts bitterness. Compared to regular iso-alpha acid products, **RHO-S 30 %** lends a smoother, non-lingering bitterness to beer.

Depending on the total bitterness and type of beer, the intensity of the bitterness of rho iso-alpha acids is 60 to 70 % of that achieved with iso-alpha acids. Thus, the sensory factor of rho iso-alpha acids is 0.6 – 0.7 times the bitterness of iso-alpha acids at a value of 1.0.

• Quality

All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards.

❖ Packaging

RHO-S 30 % is normally packaged in 20 kg pails.

❖ Product Use

RHO-S 30 % is typically used as a post-fermentation addition. However, it may be applied as a partial or even complete addition to the wort in order to reduce the risk of bacterial infection.

• Dosage

Dosage of **RHO-S 30 %** is based on an estimated or known utilization and the desired intensity of bitterness in the beer. The fact that the bitterness of rho iso-alpha acids is about 30 % less than that of iso-alpha acids derived from conventional hop products must be taken into consideration (see Flavor section).

• Application

For a post-fermentation addition, **RHO-S 30 %** can be used as delivered.

We recommend in-line additions directly into the beer stream, preferably at a point where vigorous mixing is assured, after primary filtration and gravity adjustment. The addition must be completed prior to final clarification and should take place over at least 70 % of the total volume being transferred.

If dilution is necessary, always add **RHO-S 30 %** to demineralized water first and adjust the pH to 8.5 – 9.5 using either potassium hydroxide (KOH) or potassium carbonate (K₂CO₃). Laboratory scale testing is recommended prior to commercial use.

If containers are used over several days, it is recommended that the headspace be flushed with nitrogen (CO₂ is not suitable).

- **Cleaning Recommendation**

RHO-S 30 % should not be left in dosing lines at low temperatures. Lines and dosing pumps should be flushed with warm, slightly alkaline, demineralized water or ethanol for purposes of cleaning.

- **For Light Stable Beer**

For maximum protection against lightstruck flavor, it is essential that no other sources of non-reduced iso-alpha acids are inadvertently introduced into the wort or beer. Therefore, the following must be carefully implemented:

- exclusive use of light stable hop products throughout the entire process
- avoid contamination through equipment surfaces previously in contact with regular iso-alpha acids
- never pitch wort with yeast that has been in contact with regular alpha and iso-alpha acids

- **Storage**

RHO-S 30 % should be stored in sealed containers at 5 – 25 °C (41 – 77 °F). Opened containers should be used within a few days. For long-term storage, the ideal temperature is between 10 – 20 °C (50 – 68 °F). Freezing during transport will not damage the product.

- **Best Before Date**

RHO-S 30 % is stable for three years from the date it was produced / packaged if stored under the recommended conditions.

- **Safety**

RHO-S 30 % is a slightly alkaline, intensely bitter product and may be safely handled using routine precautions to avoid contact with skin and, in particular, the eyes. Any product coming into contact with the skin should be washed off immediately with soap and water or an appropriate hand cleanser. If **RHO-S 30 %** gets into the eyes, flush with copious amounts of water until clear and seek medical attention.

For full safety information, please refer to the relevant Hopsteiner® safety data sheet.

❖ Analytical Methods

- **Concentration of Bitter Substances**

The concentration of rho iso-alpha acids can be measured using the following methods:

- HPLC according to Analytica-EBC 7.9
- UV spectrophotometric analysis

- **Concentrations of Reduced Iso-Alpha Acids in Beer**

The concentration of reduced iso-alpha acids in beer can be measured by HPLC according to Analytica-EBC 9.47.

Note:

It is possible that analysis results for the corresponding value for bitterness must be adjusted. The factor used in this analysis will result in lower values if reduced hop products were used as the exclusive source for bitterness or in higher amounts.

❖ Technical Support

We are pleased to offer assistance and advice on the full range of Hopsteiner® products:

- copies of all relevant analytical procedures
- Safety Data Sheets (SDS)
- assistance with pilot or full-scale brewing trials
- special analytical services

Disclaimer: The information provided in this document is believed to be correct and valid. However, Hopsteiner® does not guarantee that the information provided here is complete or accurate and thus assumes no liability for any consequences resulting from its application.