KETTLE REDI®

Kettle Redi® is prepared from CO_2 extract and contains rho-iso-α-acids in their free-acid form along with soft resins and hop oils. Kettle Redi® can be used as a complete replacement for normal kettle extract.

Characteristics

Kettle Redi® is an alternative to CO_2 extract resulting in higher bitterness efficiency by replacement of hops, pellets, or extract in the kettle. Properties are generally similar to conventional CO_2 extract but provide utilization improvements similar to pre-isomerized kettle products with added protection against light-struck flavors when used as the sole source of hop-derived bittering or in combination with other light-protected hop bittering products. The product is classified as a modified hop extract that may be safely used in beer in accordance with US FDA regulation 21 CFR 172.560 (b)(1).

Product Specifications

Description: A homogeneous solid paste of the free acid form of reduced isomerized α-acids, β-acids and hop oils. The color can vary from amber to brown.

Rho-iso-α-acids:	38 – 42 %
Iso-α-acids:	< 0.3 %
α-acids:	< 0.1 % (below the detection limit)
β-acids:	1 – 5 %
Hop oils:	12 – 20 %
Density:	900 – 1,100 kg.m³
Viscosity	approx. 1 – 3 Pas at 30 – 40 °C (86 – 104 °F)
Storage Temperature:	4 -10 °C (39-50 ° F)

Product Use

Kettle Redi® can be used as a replacement of cone hops, pellets, or extract in the kettle. The bitterness utilization is typically in the range 45 – 55 % and mostly irrespective of the time of addition. However, the dosing rate depends on the expected utilization for the chosen point of addition and must also allow for the fact that rho-iso-α-acids are less bitter than normal iso-α-acids by a factor of 0.7. The quantity to be added is calculated using the rho-iso-α-acids content and the expected utilization. We recommend performing trials with Kettle Redi® to determine its suitability, since the utilization may vary depending on plant and processing parameters. If added by means of an automatic dosing system, the extract should be warmed to 40 - 50 °C and gently agitated to ensure effective dosing.

Usage Calculations

The following calculations are based on the fact that, for the same concentration in beer, rho-iso-α-acids (rho-IAA) are reported to have only 0.7 sensory bitter units compared with normal iso-α-acids (IAA). Utilization of rho-IAA is likely to be about 45 – 55 % when used in the kettle.

Desired Sensory Bitterness Units = BU

Rho-IAA required in beer (mg/L) = $\frac{BU}{0.7}$ (*0.7 = bitterness of rho-IAA relative to IAA*)

Dosage rho-IAA in mg/L (*45% utilization assumed*) = $\frac{BU}{0.7} \times \frac{100}{45}$

Dosage in grams rho-IAA per hL of beer = $\frac{BU}{0.7} \times \frac{100}{45} \times \frac{100}{1000}$

Dosage amount of Kettle Redi® (40% rho-IAA) in g/hL :

$$\frac{BU}{0.7} \times \frac{100}{45} \times \frac{100}{1000} \times \frac{100}{40}\, g/hL = BU \times 0.79\, g/hL$$

*(e.g. in order to achieve a bitterness of **12** desired sensory bitter units (12/0.7 X 100/45 X 100/1000 X 100/40) = **9.5** g/hL of* Kettle Redi®*).*

Quality and Food Safety

The Barth-Haas Group maintains quality management systems registered to the ISO 9001 standard, as well as food safety management programs based on internationally recognized (HACCP) principles. Please refer to our web site (www.barthhaasgroup.com) for more information on our systems and programs.

Light Stability

Kettle Redi® will only provide protection from light-struck flavor if a complete absence of normal iso-α-acids is achieved; therefore, no other sources of non-reduced iso-α-acids should exist in the wort or beer streams. Thus, for light-stable beers packaged in clear or green glass bottles, all the hop bitterness must be derived from reduced hop acids such as Kettle Redi®, Tetrahop Gold®, Redihop® or Hexahop® products. Iso-α-acids (including any from equipment or yeast) must not be present in the beer. If beta extracts are used as kettle additives, ensure that the concentration of α-acids and iso-α-acids are below 0.3%.

Packaging

Container sizes are 3 and 18 kg. All internal surfaces of containers are lined with a food grade coating.

Storage and Shelf Life

Kettle Redi® should be stored in full, closed containers between 4 - 10 °C (39 - 50 °F). The product should not be stored frozen (< 0 °C). When stored at recommended conditions it is best if used within 24 months of the date of production. Opened containers should be used within a few days.

Analytical Methods

The following methods of analysis are recommended for Kettle Redi®:
o EBC Method 7.8 for rho-iso-α-acids by HPLC
o ASBC hops 9 C and EBC 7.7 for Iso-α-acids, α-acids, β-acids by HPLC
o EBC 7.10 for Hop oils
o ASBC Hops-13 for Hop oils

Safety

Any material coming into contact with the skin should be washed off with soap and water. For more information refer to the relevant Safety Data Sheet (SDS).

Technical Support

We will be pleased to offer help and advice on the use of Kettle Redi® in brewing.
E-Mail: Brewingsolutions@barthhaas.de or brewingsolutions@johnihaas.com