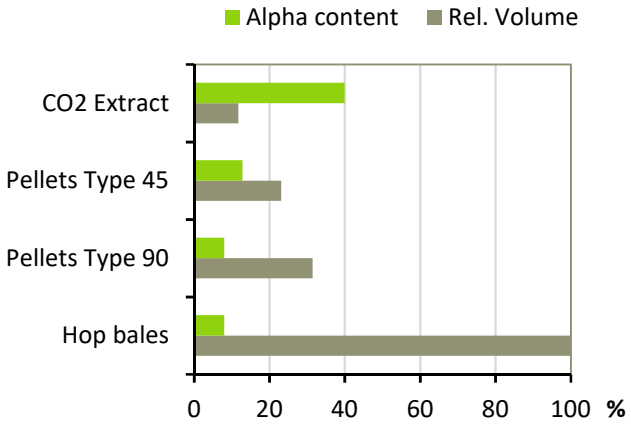
CO_2-Extract

❖ Overview

- **CO_2-Extract** is made from hop pellets using food grade carbon dioxide in liquid or supercritical form.
- **CO_2-Extract** contains alpha acids, beta acids and essential oils and can be used in the brewing process to partially or entirely replace leaf hops or hop pellets.
- **CO_2-Extract** presents a concentrated and practical alternative to leaf hops or pellets with an excellent shelf life.

Reduction of volume of an 8 % Alpha Hop compared to Product Form



❖ Specification

- Description: Golden green to amber extract, highly viscous at room temperature.
- Alpha acids*: 20 – 55 %
- Beta acids*: 15 – 40 %
- Hop oil*: 3 – 12 %
- pH: 4.0 (± 0.5)
- Viscosity*: 200 – 400 mPas at 45°C (113°F)
- Density: 0.9 – 1.0 g / ml at 20°C (68 °F)

* dependent on variety and crop year

PDS 05/09 issued 04/2017

S.S.Steiner, Inc.
New York, USA
Tel:(1) 212 838 8900
Fax:(1)212 593 4238
E-mail: sales@hopsteiner.com

Simon H. Steiner, Hopfen, GmbH
Mainburg, Germany
Tel: (49) 8751 8605-0
Fax: (49) 8751 8605-80
E-mail: info@hopsteiner.de

Steiner Hops Ltd.
Epping, England
Tel: (44) 1992 572331
Fax: (44) 1992 573780
E-mail: enquiries@hopsteiner.co.uk

Hopsteiner Trading (Zhuhai) Co., Ltd.
Zhuhai, PRC
Tel: (86) 756 322 3340
Fax: (86) 756 322 3345
E-mail: info@hopsteiner.com.cn

❖ Properties

- **Appearance**

  A golden green to amber thick syrup (dependent on variety and extraction conditions) which becomes more fluid on warming.

- **Utilization**

  If **CO_2-Extract** is boiled for at least 50 minutes, an utilization in the range of 32 – 38 % can be achieved. Actual utilization will vary from brewery to brewery depending on plant and process conditions.

- **Flavor**

  The flavor characteristics of the original hops are almost completely maintained. Early addition of **CO_2-Extract** during wort boiling imparts mainly bitterness.

- **Chemical Residues**

  Nitrates and heavy metals are almost completely eliminated in **CO_2-Extract**. Many pesticide and fungicide residues are also largely removed by CO_2-extraction.

- **Quality**

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

❖ Packaging

CO_2-Extract can be packaged in cans, pails and drums according to customer requirements:

Cans: 0.5 to 4 kg USA
0.5 to 10 kg Germany
Pails: 3 to 20 kg USA only
Drums: 50 & 200 kg

For convenience of use, customers may have their extract packed in cans to any desired content of alpha acids per container (e.g. 450 g alpha acids per can).

Alternatively, the alpha acids content of **CO_2-Extract** can be standardized to any particular concentration using glucose syrup (non-GM glucose cannot be guaranteed) and the container filled to a standard weight (e.g. 30 % alpha in 1-kg cans).

❖ Product Use

CO_2-Extract is typically added into the kettle as a complete or partial replacement for leaf hops or hop pellets.

- **Dosage**

  Addition to the kettle is based on the concentration of alpha acids in the **CO_2-Extract**, an estimated or known utilization and the desired bitter intensity in the beer.

- **Addition**

  For the best utilization **CO_2-Extract** should be added early in wort boiling. **CO_2-Extract** is not very suitable for “late hop additions” due to the unpolar character. However, in this situation, better results can be achieved using the pre-isomerized kettle extracts IKE or PIKE due to their better solubility.

  If **CO_2-Extract** is used in cans, it’s not necessary to warm up prior to their use. Punctured containers suspended into the boiling wort will ensure that all of the extract is completely flushed out into the kettle.
  In case **CO_2-Extract** is used in automatic dosing units, it should be warmed up to 45°C (113°F) and gently mixed to ensure perfect dosing.

S.S.Steiner, Inc.
New York, USA
Tel:(1) 212 838 8900
Fax:(1)212 593 4238
E-mail: sales@hopsteiner.com

Simon H. Steiner, Hopfen, GmbH
Mainburg, Germany
Tel: (49) 8751 8605-0
Fax: (49) 8751 8605-80
E-mail: info@hopsteiner.de

Steiner Hops Ltd.
Epping, England
Tel: (44) 1992 572331
Fax: (44) 1992 573780
E-mail: enquiries@hopsteiner.co.uk

Hopsteiner Trading (Zhuhai) Co., Ltd.
Zhuhai, PRC
Tel: (86) 756 322 3340
Fax: (86) 756 322 3345
E-mail: info@hopsteiner.com.cn

- **Storage**

  CO_2-Extract should be stored in sealed containers at < 10°C (50°F). Opened containers should be used within a few days.

- **Best Before Date**

  CO_2-Extract is stable 8 years from date of production under the recommended storage conditions.

- **Safety**

  CO_2-Extract is a natural substance and 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 or proprietary hand cleansers. If **CO_2-Extract** gets into the eyes, irrigate with excess water until clear and seek medical attention.
  For full safety information please see the relevant Hopsteiner® safety data sheet.

❖ Analytical Methods

- **Concentration of Bitter Substances**

  Alpha and beta acids can be measured by any of the following methods:
  - HPLC method according to Analytica-EBC 7.7 or ASBC Hops-14 using the current ICE standard
  - Spectrophotometric method according to ASBC Hops-8 (I)

  The lead conductance value can be measured by any of the following methods:
  - ASBC Hops-8 (II)
  - Analytica-EBC 7.6

- **Concentration of Hop Oils**

  Hop oil concentration can be measured by any of the following methods:
  - Analytica-EBC 7.10
  - ASBC Hops-13

❖ Technical Support

We will be pleased to offer help and advice on the full range of Hopsteiner® products:

- Copies of all relevant analytical procedures
- Safety Data Sheets (SDS)
- Assistance with pilot or full brewery trials
- Specialist analytical services

Limited warranty and liability – Information in this document is believed to be accurate and reliable.
However, Hopsteiner® does not give any representation or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of such information.

S.S.Steiner, Inc.
New York, USA
Tel:(1) 212 838 8900
Fax:(1)212 593 4238
E-mail: sales@hopsteiner.com

Simon H. Steiner, Hopfen, GmbH
Mainburg, Germany
Tel: (49) 8751 8605-0
Fax: (49) 8751 8605-80
E-mail: info@hopsteiner.de

Steiner Hops Ltd.
Epping, England
Tel: (44) 1992 572331
Fax: (44) 1992 573780
E-mail: enquiries@hopsteiner.co.uk

Hopsteiner Trading (Zhuhai) Co., Ltd.
Zhuhai, PRC
Tel: (86) 756 322 3340
Fax: (86) 756 322 3345
E-mail: info@hopsteiner.com.cn