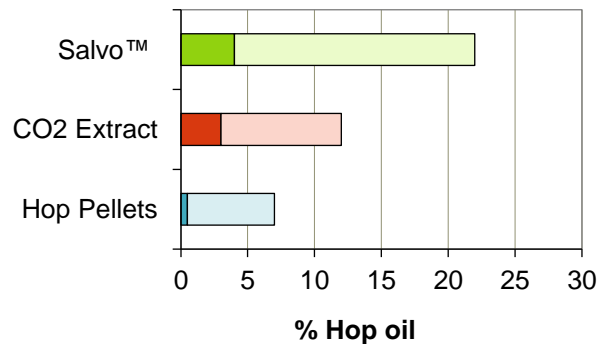


# Salvo™

## ❖ Overview

- **Salvo™** is derived from CO<sub>2</sub> hop extract and contains predominantly hop essential oils and beta acids.
- **Salvo™** can be added early to the wort kettle as an antifoam agent. If added late in the boil, this product imparts a distinct variety specific hop aroma to beer.
- **Salvo™** can help suppress microbial infections due to the presence of beta acids.
- **Salvo™** has little to no sensorial bitterness .

Comparison of hop oil concentration in hop products



## ❖ Specifications

- Description: A yellow-brown, semisolid extract containing β-acids, hop essential oils and waxes
- Beta acids\*: 24 – 55 %
- Hop oil\*: 4 – 22 %
- Iso-alpha acids: 0.2 – 2.9 %
- Alpha acids: 0.2 – 1.2 %
- Viscosity: 30 – 100 mPas at 50 °C (122 °F)
- Density: 1.0 g/ml at 20 °C (68 °F)

\* dependent on variety and crop year

## ❖ Properties

### • Appearance

**Salvo™** is a yellow-brown, semisolid or moderately viscous paste which becomes fluid when warmed.

### • Utilization

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

### • Flavor

**Salvo™** delivers impactful variety specific flavor when added to the kettle/whirlpool. Late additions impart a typical “late hop” aroma to the finished beer.

Residual iso-alpha and alpha acids might contribute slightly to beer bitterness, depending on quantity added.

### • Quality

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

## ❖ Packaging

**Salvo™** is packaged in cans:

Cans: 0.5 to 4 kg

## ❖ Product Use

**Salvo™** is typically added in the brewhouse. An early addition can help to prevent over-boiling of the wort. Good recovery of aroma substances can be achieved when added late to the boil or into the whirlpool.

### • Dosage

Actual dosage of **Salvo™** will depend on the extract analysis, the time of the addition and the desired intensity of hop aroma.

Example: (hop oil content of 15 %)

Add 13.4 g/hl **Salvo™** toward the end of the boil. This corresponds to a hop oil addition of 2.0 g/hl.

### • Application

If **Salvo™** is added manually, it should be warmed to 75 °C (167 °F) and gently mixed to ensure perfect dosing.

- **Storage**

**Salvo™** should be stored in sealed containers at temperatures < 10 °C (50 °F). If measuring out smaller amounts for each brew, make sure extract is thoroughly mixed to evenly disperse the hop oil. Cover containers being filled, label, and store in refrigerator or freezer until needed. Open container should be sealed up or used within 6 months.

- **Best Before Date**

**Salvo™** is stable for six years from the date it was produced / packaged if stored under the recommended conditions.

- **Safety**

**Salvo™** should be handled like regular CO<sub>2</sub> extract. Any product coming into contact with the skin should be immediately washed off with soap and water or an appropriate hand cleanser. If **Salvo™** 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 Beta Acids**

Beta acids (as well as iso-alpha acids and alpha acids) can be measured using the following methods:

- HPLC according to Analytica-EBC 7.8 or ASBC Hops-16 with the current ICS and ICE standards

- **Concentration of Hop Oil**

The hop oil concentration can be measured using the following methods:

- Analytica-EBC 7.10
- ASBC Hops-13

## ❖ 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