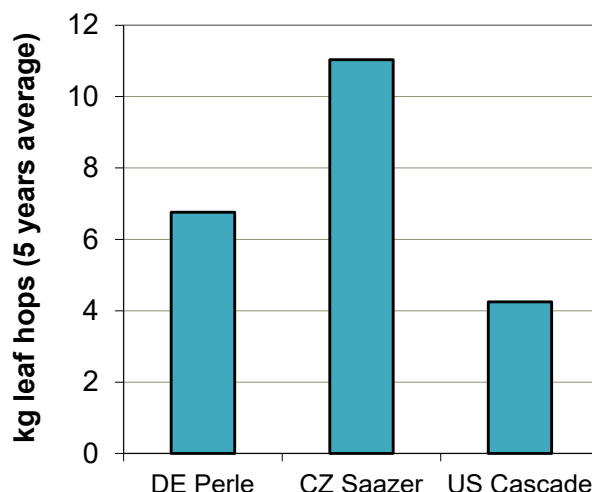


## Hop Oil – Type NOBLE PLUS

### ❖ Overview

- **Hop Oil – Type NOBLE PLUS** is produced by conventional hop extraction with subsequent fractionation by means of distillation.
- **Hop Oil – Type NOBLE PLUS** has been specifically developed for additions prior to filtration. This product can completely or partially replace late hop additions in the brewhouse while still imparting a typical “late hop” aroma to the beer.
- **Hop oil - Type NOBLE PLUS** has been shown to improve the taste of non-alcoholic beers in particular.
- **Hop oil - Type NOBLE PLUS** has an excellent hop oil recovery.

Equivalent leaf hop quantity to 100g Type NOBLE PLUS (based on Linalool)



### ❖ Specifications

- **Description:** pure hop oils diluted in propylene glycol, resulting in a product diluted to 1:100
- **Key compound:** linalool 2000 ppm ( $\pm$  50 ppm)
- **Specific ratios:**
  - linalool/myrcene > 5
  - linalool/caryophyllene > 30
  - linalool/humulene > 15
  - linalool/farnesene > 25
- **Bittering substances** not detectable
- **Viscosity:** approx. 46 mPas at 25 °C (77 °F)
- **Density:** approx. 1.0 g/ml at 20 °C (68 °F)

## ❖ Properties

### • Appearance

**Hop Oil – Type NOBLE PLUS** is a nearly colorless to light green, transparent or slightly turbid liquid, containing hop essential oils.

### • Flavor

**Hop Oil – Type NOBLE PLUS** contains a lower amount of the volatile hydrocarbon fraction, resulting in a more subtle and pleasant hop aroma.

Depending on the quantity added and the type of beer, **Hop Oil – Type NOBLE PLUS** imparts particularly pronounced floral and citrusy notes to beer.

**Hop Oil – Type NOBLE PLUS** has little influence on the sensory bitterness of beer.

It is suitable for use in beers brewed with conventional hop products as well as light stable beers to impart a more typical “late hop” character.

During beer aging the aroma components of **Hop Oil – Type NOBLE PLUS** remain stable and contribute to overall flavor stability.

### • Utilization

**Hop Oil – Type NOBLE PLUS** has an excellent recovery rate. Depending on the time of the addition, the recovery rate for hop oil can be close to 100%.

### • Quality

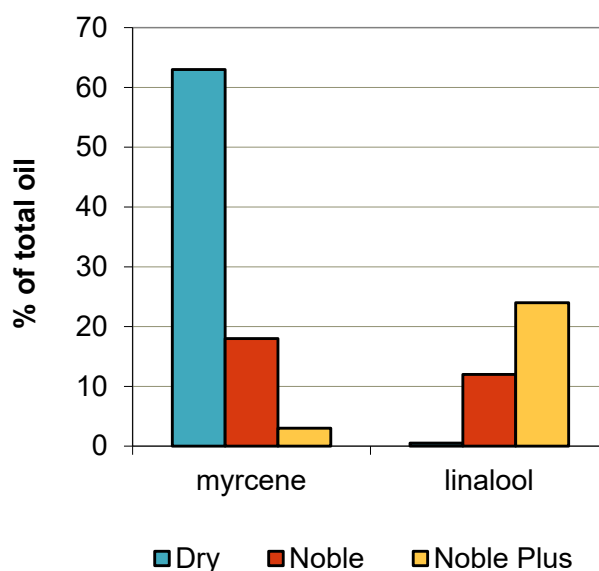
All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards.

## ❖ Packaging

**Hop Oil – Type NOBLE PLUS** is normally packaged in aluminum bottles of various sizes.

**Hop Oil – Type NOBLE PLUS** is supplied as a 1:100 dilution in propylene glycol (recommended). Other dilutions, packaging or pure hop oils may be available on request.

Comparison of hop oil products



## ❖ Product Use

### • Dosage

**Hop Oil – Type NOBLE PLUS** is supplied as a 1:100 dilution in propylene glycol. The quantity of the hop oil addition is determined by the brewer and depends on the time and point of the addition.

The hop oil dosage should be based on the desired concentration of linalool in the beer. The threshold in beer is usually around 20 µg/l. This lowest concentration is intended for orientation only. Actual addition will depend on the quality and intensity of the aroma desired. Typical range of application is **1.0 - 5.0 ml/hl**.

Trials performed by injecting the product into bottled beer with a microliter syringe are helpful for determining the quantity of **Hop Oil – Type NOBLE PLUS** required.

## • Application

**Hop Oil – Type NOBLE PLUS** can be added at different stages on the cold side of beer production, typically prior to filtration. For the highest possible yield, a direct addition into the beer stream prior to filtration is recommended. This enables the hop oil to dissolve in the beer without changing its flavor.

Shake bottle well before use.

## • Storage

**Hop Oil – Type NOBLE PLUS** should ideally be stored at temperatures of 1 - 10 °C and in the delivered original container.

## • Best Before Date

**Hop Oil – Type NOBLE PLUS** is stable two years from the date it was produced / packaged if stored under the recommended conditions. Once opened, it is recommended to use within one month and limit the number of openings.

## • Safety

Any product coming into contact with the skin should be immediately washed off with soap and water. If **Hop Oil – Type NOBLE PLUS** 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

### • Aroma Compounds

Individual hop oil compounds can be analyzed by means of gas chromatography techniques using the following methods:

- Analytica-EBC 7.12
- ASBC Hops-17

## ❖ Technical Support

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

- 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.