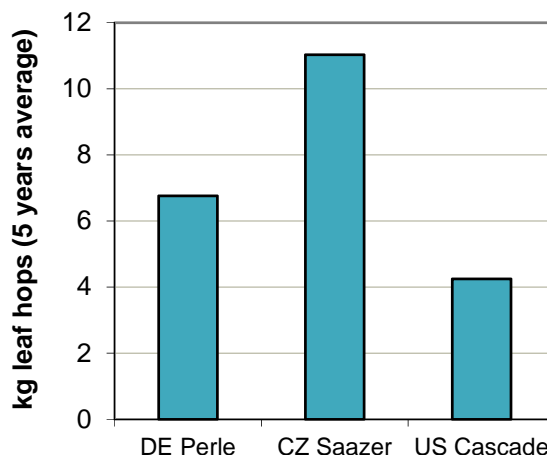


Hop Oil – Type NOBLE PLUS

❖ Overview

- **Hop Oil – Type NOBLE PLUS** is produced from conventional hop extracts which are subsequently fractionated by means of CO₂ extraction to enrich or decrease the concentration of specific aroma compounds.
- **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 recovery is considerably higher compared to conventional hopping methods, as the aroma compounds are not lost due to evaporation in the brewhouse.

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 (± 50 ppm)
- **Specific ratios:**
 - linalool/myrcene > 5
 - linalool/caryophyllene > 30
 - linalool/humulene > 15
 - linalool/farnesene > 25
- **Viscosity:** 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, clear liquid containing hop essential oils.

• Flavor

Hop Oil – Type NOBLE PLUS contains a lower amount of the undesirable 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** can impart floral, spicy and citrusy notes to beer.

In addition, **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.

• Recovery

Hop Oil – Type NOBLE PLUS contains fewer volatile hop compounds and therefore excellent recovery rates are possible. Depending on the time of the addition, the recovery rate for hop oil can be as high as 95 %.

• Quality

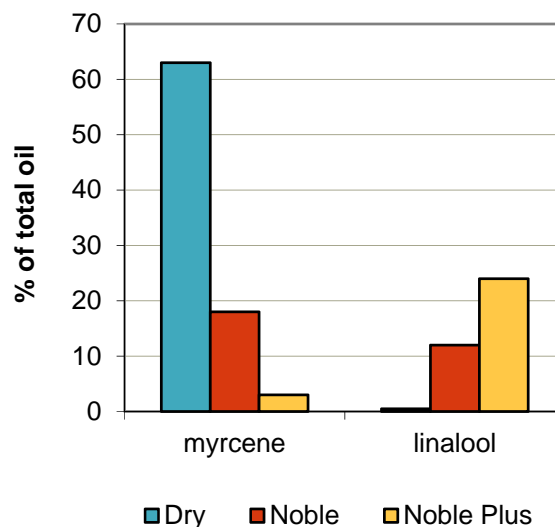
All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards.

❖ 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, which typically ranges from 20 µg/l to 100 µg/l. These concentrations are intended for orientation only; actual additions will depend on the quality and intensity of the aroma desired.

Trials performed by injecting oil into filtered beer (bright beer) with a microliter syringe are helpful for determining the quantity of hop oil required.

Dosage example for a 1:100 dilution of hop oil, based on a yield of 90 %*:

1.1 ml/hl results in 20 µg/l linalool in beer
5.5 ml/hl results in 100 µg/l linalool in beer

*can vary from brewery to brewery

• Addition

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 oils to dissolve in the beer without changing their flavor.

• Storage

Hop Oil – Type NOBLE PLUS should be stored at temperatures < 10 °C (50 °F) in screw-top aluminum bottles. If aluminum bottles are not used, exposure to light must be avoided.

• 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. Packaging can be opened once per week for a period up to 1 month.

• 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:

- 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.