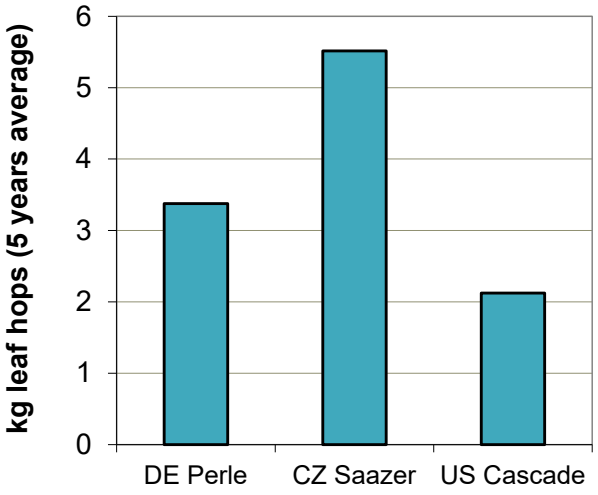
Hop Oil – Type NOBLE

❖ Overview

- **Hop Oil – Type NOBLE** is produced by conventional hop extraction with subsequent fractionation by means of distillation.
- **Hop Oil – Type NOBLE** 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 (based on Linalool)



❖ Specifications

• Description:	pure hop oils diluted in propylene glycol, resulting in a product diluted to 1:100	
• Key compound:	linalool	1000 ppm (± 50ppm)
• Specific ratios:	linalool/myrcene	> 0.5
	linalool/caryophyllene	> 4
	linalool/humulene	> 1
	linalool/farnesene	> 10
• Bittering substances:	not detectable	
• Viscosity:	approx. 46 mPas at 25 °C (77 °F)	
• Density:	approx. 1.0 g/ml at 20 °C (68 °F)	

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❖ Properties

- **Appearance**

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

- **Flavor**

  Hop Oil – Type NOBLE contains a lower amount of 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** imparts mainly floral and citrusy notes to beer.

  Hop Oil – Type NOBLE 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** remain stable and contribute to overall flavor stability.

- **Utilization**

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

- **Quality**

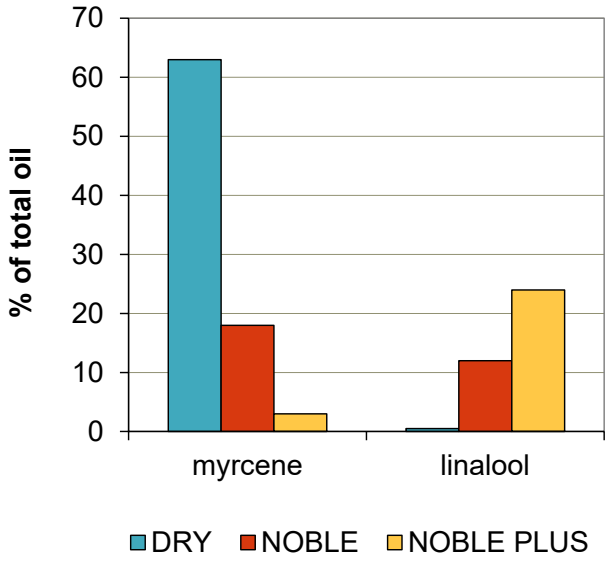
  All Hopsteiner® products are processed in facilities which fulfill internationally recognized quality standards.

❖ Packaging

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

Hop Oil – Type NOBLE 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 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.

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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 **2.0 - 10.0 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** required.

- **Application**

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

- **Best Before Date**

  Hop Oil – Type NOBLE 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** 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.

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