Hop Oil – Type DRY Variety-Specific (v.s.)

❖ Overview

• **Hop Oil – Type DRY v.s.** is produced from leaf hops of a specific hop variety and contains the complete range of essential oils characteristic of the variety.

• **Hop Oil – Type DRY v.s.** can be added at various points in the brewing process (typically on the cold side of production) and results in improved aroma yields compared to traditional hopping techniques.

• **Hop Oil – Type DRY v.s.** imparts a typical dry-hopped aroma which varies depending on the time of the addition.

❖ Specifications

• **Description:** pure hop oils of a single hop variety diluted in a blend of propylene glycol and ethanol, resulting in a product diluted to 1:100

• **Key compounds***: myrcene variety-dependent
  humulene variety-dependent
  caryophyllene variety-dependent
  farnesene variety-dependent

• **Bittering substances:** < 0.1 %

• **Viscosity:** 46 mPas at 25 °C (77 °F)

• **Density:** approx. 1.0 g/ml at 20 °C (68 °F)

*detailed information is provided in the accompanying certificate of analysis*
Properties

• **Appearance**

  Hop Oil – Type DRY v.s. is a nearly colorless, clear liquid, containing the complete range of hop essential oils.

• **Utilization**

  Depending on the time and point of the addition, the recovery rate for hop oil can be as high as 95%. Actual utilization will vary from brewery to brewery due to differences in equipment and process conditions.

• **Dosage**

  The required quantity of Hop Oil – Type DRY v.s. diluted to 1:100 (see Packaging section) depends on the point of the addition:

  - Pre-fermentation: up to 500 g per hl
  - Maturation tank: 50 – 300 g per hl
  - Prior to filtration: 1 – 20 g per hl

  The dosage rates above are intended for orientation only; actual additions will depend on the intensity of the aroma desired. Trials performed by injecting oil into the beer with a microliter syringe are helpful for determining the quantity of hop oil required.

• **Addition**

  Hop Oil – Type DRY v.s. can be added at different stages of beer production. Dosing equipment which pumps the product into the beer stream is preferred for the addition of Hop Oil – Type DRY v.s. Alternatively, the hop oil can be added to the tank prior to filling.

  - Pre-fermentation: the loss of volatile compounds during fermentation, combined with the biochemical modification of aroma compounds by yeast, can produce a less grassy aroma.
  - Maturation tank: additions to the maturation tank will result in slight changes to the hop aroma, due to yeast activity.
  - Prior to filtration, direct additions result in an almost unchanged flavor. However, there are certain losses of non-polar compounds.

• **Packaging**

  Hop Oil – Type DRY v.s. is normally packaged in aluminum bottles of various sizes.

  Hop Oil – Type DRY v.s. is usually supplied as a 1:100 dilution in a blend of 95% propylene glycol and 5% ethanol (recommended). Other dilutions or pure hop oils may be available on request.

包装

・外观

  Hop Oil – Type DRY v.s. 是一种近乎无色的透明液体，含有完整的香脂烯。

・利用

  根据添加时间和地点的不同，复原率可高达95%。实际情况会因设备和工艺条件的差异而异。

・剂量

  The required quantity of Hop Oil – Type DRY v.s. diluted to 1:100 (see Packaging section) depends on the point of the addition:

  - Pre-fermentation: up to 500 g per hl
  - Maturation tank: 50 – 300 g per hl
  - Prior to filtration: 1 – 20 g per hl

  上述剂量率仅用于指导；实际添加量将取决于所希望的香气强度。通过将油滴入啤酒中的微升注射器试验有助于确定所需的油量。

・添加

  Hop Oil – Type DRY v.s. 可以在啤酒生产的不同阶段添加。泵送装置将产品泵入啤酒流是优选的添加Hop Oil – Type DRY v.s.。或者，可以将油添加到罐中，然后再进行灌装。

  - Pre-fermentation: 芳香组分的损失在发酵过程中，结合酵母的生物化学修饰，可以产生较不草本的香气。
  - Maturation tank: 添加到成熟罐中的添加物会使跳香成分发生轻微变化。
  - Prior to filtration, 直接添加会保持基本不变的风味。然而，某些非极性化合物会损失。

・包装

  Hop Oil – Type DRY v.s. 通常包装在各种尺寸的铝瓶中。

  Hop Oil – Type DRY v.s. 通常以1:100的稀释度存在于95%丙二醇和5%乙醇（建议）的混合物中。其他稀释度或纯香脂烯可能根据需求提供。
• **Storage**
  Hop Oil – Type DRY v.s. should be stored at temperatures < 10 °C (50 °F) in screw-top aluminum bottles.

• **Best Before Date**
  Hop Oil – Type DRY v.s. is stable for one year 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 or an appropriate hand cleanser. If Hop Oil – Type DRY v.s. 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.

✈ **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.

✈ **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