

**General:**

Hop Oil Emulsions are prepared from distilled Hop Oils or oil rich extracts and contain food grade emulsifiers. They are available from most commercial hop varieties.

1. Emulsions made from distilled Hop Oil contain essential oil of hops with food grade emulsifiers. Oil content is normally standardised to 2500ppm (0.25%) by volume. These emulsions are suitable for use in light-stable beers.
2. Emulsion made from Oil rich extracts containing essential oil of hop and some hop resin in aqueous emulsion with food grade emulsifiers. Oil content is standardised either to 1,000 ppm (0.1%) or 10 000 ppm (1.0%) by volume.

**Characteristics:**

The emulsions convey the characteristic aroma and flavour of the hops from which they are prepared. They are fully dispersed in an aqueous emulsion and they provide all the benefits of Pure Hop Oils but in the form of an emulsion that is readily dispersible in beer and therefore easy to handle. The hop oil compounds are predominantly terpene hydrocarbons.

Hop Oil Emulsions represent a cost-effective easy-to-use hop oil formulation. They provide a 'Dry Hop' character by addition to beer either pre- or post-fermentation. Emulsions produced with distilled Hop Oil may also be used to provide "late hop" aroma in beers brewed with reduced isomerised products for light protection.

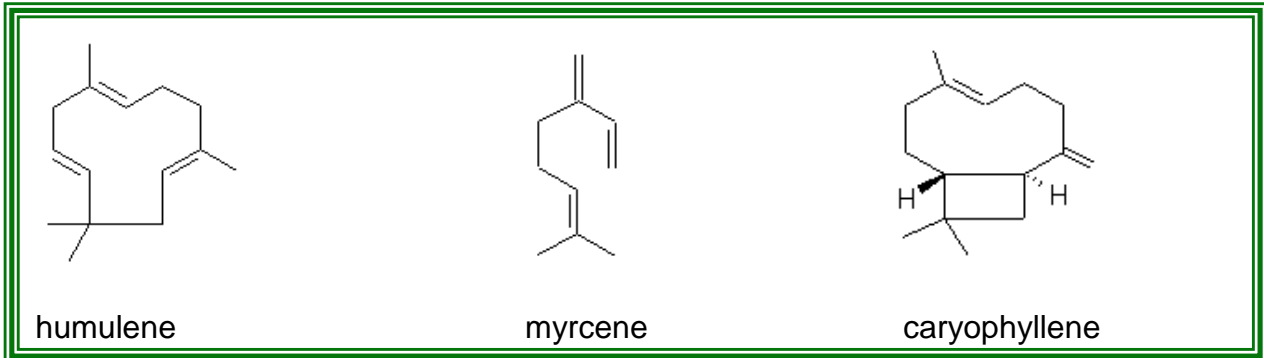


Fig. 1: Characteristic hop oil compounds

**Product specifications:**

- Description: an off-white aqueous dispersion of hop oil and food grade emulsifiers.
- Hop oils: 0.1-1.0% of specified variety (or specified blend)
- Density: 1.0 g/ml
  
- Heavy metals: Meets current EU and US FDA regulations
- Lead: Meets current EU and US FDA regulations
- Pesticides: Meets current EU and US FDA regulations

**Product Use:**

Hop Oil Emulsion may be added pre-filtration preferably between fermentation and racking back where yeast counts are below  $0.5 \times 10^6$  cells per ml. Addition rates of Hop Oil Emulsion should be adjusted to give 0.5-2.0 ppm hop oil in the finished beer. (e.g. 2 ppm pure hop oil = 20 ml emulsion/hl beer of a 1% standardized emulsion) dependent upon the intensity of aroma and taste required and the characteristics of the base beer.

When used to impart “late hop” character we suggest Hop Oil Emulsion may be metered into a hot wort transfer pipe/line over as large a volume as possible. For “late hop” character we recommend addition rates of 1 ppm - 10 ppm hop oil (e.g. 10 ppm pure hop oil = 100 ml emulsion/hl beer of a 1% standardized emulsion). This will be dependent upon the point of addition, characteristics of the base beer as well as the intensity of aroma and taste required. Dosing experiments, using a pipette or microlitre syringe will give useful indications of the required quantity.

**Packaging:**

20 or 25kg HDPE drums or 1000 litre IBC's. Smaller packaging options are available on request.

**Storage and shelf life:**

Store in full, closed containers at 3° to 6°C (37-43 °F). We recommend the usage within 6 months. After 6 month storage, it is recommended that an analysis is carried out to determine its activity for dosage adjustment if necessary.

**Analytical Methods:**

For the analysis of the composition of hop oils, gas chromatography (GC) techniques are used. Details of methods are available on request.

**Safety:**

Any material coming into contact with the skin should be washed off with soap and water. For more information download the relevant Material Safety Data Sheet (MSDS).

**Technical Support:**

We will be pleased to offer help and advice on the use of Hop Oil Emulsion in brewing.