

# Measuring Essential Oils

## Analysing essential oils for composition and purity

### Quality control of essential oils

**Checking the quality of essential oils is important as they are used in cosmetics and other home care products, for flavouring food and beverages and for adding scents to incense and household cleaning products. Moreover, essential oils can be used in pharmaceutical products, making the quality control even more important.**

An essential oil is a concentrated hydrophobic liquid containing volatile chemical compounds from plants. Essential oils are also known as volatile oils, ethereal oils or simply as the oil of the plant from which they were extracted. An essential oil is „essential“ in the sense that it contains the „essence“ of the plant's fragrance, e.g. lemon oil, lavender oil, rose or hemp oil. An essential oil is distilled from leaves, stems, flowers, barks, roots or other parts from plants. Essential oils, contrary to the use of the word „oil“, are not having an oily appearance. Most essential oils are clear, some are yellow or amber in colour. As essential oils are complex mixtures of various chemical

constituents the composition can be affected in every step of the production, beginning with growing and harvesting condition and ending in the storage. Diluting, cutting or extending high purity oils with lower quality and still selling them as „pure“ is one critical factor for a strong quality control. Especially when essential oils are used for health or therapeutic purposes, it is imperative that they are pure and of high quality.

There are a few techniques for analysing essential oil composition and purity. Common ISO quality standard for essential oils is to measure the physical parameters. Beside testing the oil visually and evaluating the odour, the specific optical rotation, the refractive index and the specific gravity are measured. These measurements can confirm or reject the authenticity of an oil's declared botanical species and country of origin, whilst possibly revealing any adulteration with a foreign substance or dilution processes.

### Normative reference:

ISO 592:1998-11 Essential oils - Determination of optical rotation  
ISO 280:1998-11 Essential oils - Determination of refractive index  
ISO 279:1998-12 Essential oils - Determination of relative density at 20 °C - Reference method



## Vari Family for essential oil quality control

Using our new VariPol polarimeter with complete 21 CFR part 11 compliance and a high reproducibility the quality control of an essential oil can be guaranteed. By adding the VariRef refractometer a second parameter – the refractive index – can be determined in parallel. Moreover the VariDens can be used to determine the specific gravity of the essential oil so that all of the above mentioned ISO standards can be fulfilled.

### Advantages of using the Vari-Family:

- Time and space saving
- Non-destructive and simple to perform
- Rapid temperature control
- All devices controlled via display or remote (PC, Smartphone, Tablet)
- Collected evaluation of data



**VariRef**  
Refractometer



**VariPol**  
Polarimeter



**VariDens**  
Density Meter

Product packages	Product	ID-N°
VariPol	e.g. VariPol B 101 R + 100 mm Flow through tube	31001 100000
VariRef	e.g. VariRef B 101 R + Compartment door + Flow through insert	32101 16350 16443
VariDens	e.g. VariDens B 100 R	33001
Pump	e.g. Peristaltic pump or Membrane pump	17643 + 17645 17670

### Typical Industries

- Food and Beverage industry
- Cosmetic industry
- Pharmaceutical industry

### Benefits:

- Cost and time savings
- Accurate, fast and precise measurement
- Product quality securing