

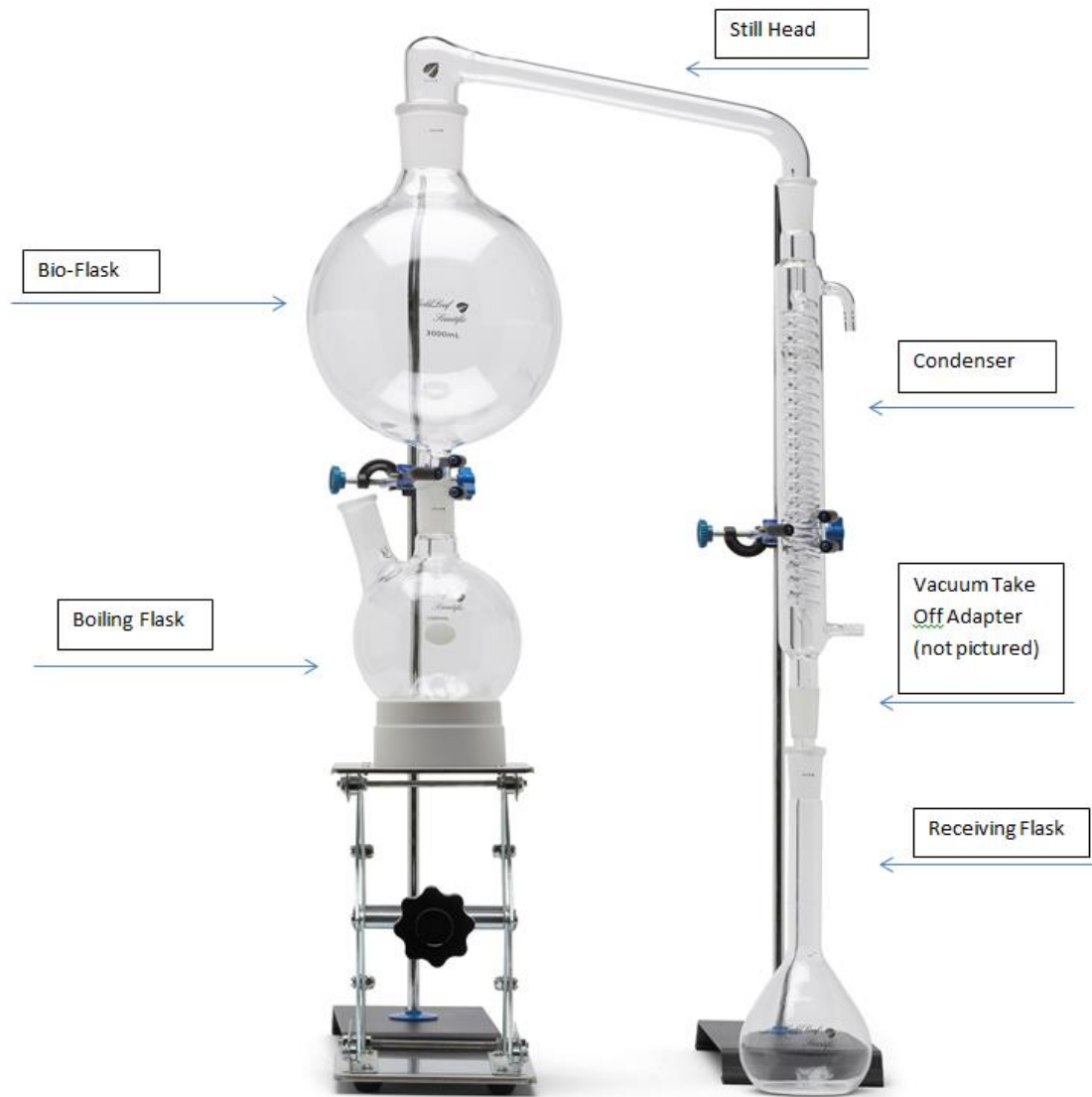


## Steam Distillation Kit User Guide



## Table of Contents

<b>Setup and Assembly</b> .....	<b>1</b>
Setup Diagram .....	2
Introduction.....	3
<b>Operating Procedures</b> .....	<b>4</b>
Procedure .....	5
Separation .....	6

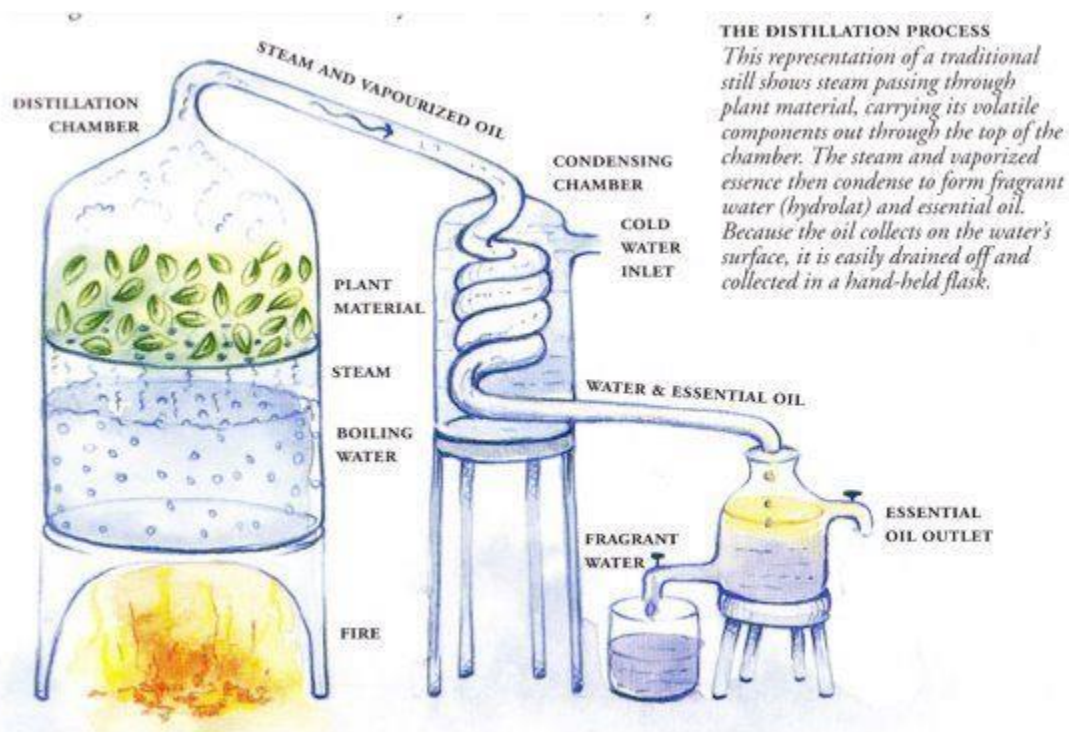


**Steam Distillation Kit Diagram**

## Introduction

Steam Distillation- is a process whereby your target compounds are co-distilled along with water vapor. By using water vapor the process is kept at a lower operating temperature which prevents damage to sensitive compounds. The water and target compounds must not be miscible so when both are condensed and collected they do not mix and can be easily separated by decanting or draining.

Steam distillation has been the preferred method of extracting scents to be used in perfumery since ancient times.



**Key Point-** Our steam distillation kits take this one step further by allowing the user to apply vacuum to lower the boiling point of water and reduce operating temperatures even further. This is very important because higher temperatures will yield poor quality terpenes with off notes of grassy/plant smells and foul volatile byproducts.

## Setup and Installation

Begin by grinding your herbs very finely. The finer the better as most essential oils/terpenes are within the encapsulate plant trichomes and must be ruptured to be released.

After completely ground weigh the bulk material.

Add a small piece of cotton or similar into the smaller join on the bio-flask. (if your kit includes a vapor wand then skip this step and just insert the wand into the joint.)

Pour your material into the large joint of biomass flask. You may want to setup and lab stand to help you keep the flask upright and in position while you pour. Continue until the flask is roughly 2/3 full.

Weigh the ground bulk material and note the difference in weight which is now inside the flask. This can be used to calculate yields later.

Setup the kit as pictured. A standard round bottom receiving flask can be used instead of the long neck volumetric flask that is pictured. (note: make sure to include the vacuum take off adapter)

### Additional Required Materials

- A heating mantle or similar to heat the boiling flask
- A chiller for the condenser capable of maintaining a temperature just about freezing (5°C for instance)
- A vacuum Pump capable of moderate vacuum that is chemical resistant. A small diaphragm pump is ideal.
- A cold trap with dry ice or an immersion chiller

Please contact us for help selecting these items

### Connections

For the chiller lines connect in on bottom of the condenser and out on top.

The vacuum source should be connected to the vacuum take off adapter. The cold trap should be between the adapter and the vacuum source.

For glass joints use ptfе sleeves or grease to seal

Once your kit is fully assembled with heating mantle, chiller, and vacuum you can start heating and pulling vacuum

## Operating Procedure

- Set the heating temperature to 40°C and begin heating
- Set your stirring to 300rpm
- Once the water has reached it's set temperature begin pulling vacuum
- When the water begins to boil use the 3-way valve or a bleed valve to maintain the vacuum and boiling (note: a vacuum regulator could be used to more consistently maintain vacuum and is much more convenient)
- Continue boiling at that pace. It will take a while for the steam to make its way through the boiling flask and into the condenser.
- When the boiling slows periodically increase vacuum and/or heat but always keep temperatures below 60°C.
- After about 30-45 mins the material in the bio-flask should be mixed to prevent pockets of overly wetted and extracted material. This is usually done by removing the flask and rotating and shaking. Reassemble and repeat process and when complete replace spent material. Note that oil rich water will be cloudy while clear water does not so this can be a good visual indicator to stop.
- You can repeat with fresh material as many times as you would like, but you may need to add some water to the boiling flask if it gets too low.

## Separation Procedure

- Collect the water and essential oil and pour into separatory funnels
- Let settle until the oil and water are clearly separate (it is recommended to seal and sit in the refrigerator for 1-4 hours)
- Drain off water layer
- Slowly drain drop by drop the last remaining water
- When there are only oils left then collect in separate vial. Filtration may be needed before use.
- Use an inert gas such as nitrogen or argon to blanket the product and store at low temperature.