



DARK SKY LAVENDER

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Essential Oils

# The Steam Distilling Process

DARK SKY LAVENDER PRESENTS

# The Steam Distilling Process

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## Introduction

*Turning blooms into profit.*

The picturesque sea of purple that are seen in blooming fields of lavender are not just appealing to the eye, they also have the farmers that till that soil seeing green. Lavender has long been touted for numerous health benefits including its calming flowery aroma and antiseptic qualities. The lavender industry is booming. Customer demand for lavender essential oil has grown steadily in recent years and the current global market value for lavender is estimated to be approximately \$109.4 million. Market studies have estimated this global market to increase to \$201.6 million by 2032 (Persistencemarketresearch.com, 2023). Steam distillation has emerged as the most common way to extract essential oils from lavender plants. This document will discuss this method used to produce lavender essential oil and lavender hydrosol.

## Audience



The specific audience for this document about extracting and distilling the essential oil from lavender plants will be members of the United States Lavender Growers Association. The USLGA members are comprised of farmers, growers, buyers, and lavender users. The audience are all paying members to the USLGA. Most are heavily invested in the lavender industry. However, members have a diverse cross section with some lavender farmers who have been farming for a number of year or growers as well as beginners who may just be exploring the preliminary stages of growing lavender or extracting and distilling the essential oils.

## Market Value

The global lavender essential oil market is growing at a compound annual growth rate of 4.8% (Absolutereports.com, 2023).

## Overview

Lavender essential oil is created by completing a process of distillation of the flower spikes of particular lavender species (agrifarming, 2023). This document will detail the process of steam distilling lavender to produce lavender essential oil and hydrosol (the water produced from the steam distillation process) using the Clawhammer Supply Essential Oil Steam Distiller.

## The Equipment

This standard steam distiller is made from 100% Food Grade 304 Stainless Steel. It is considered modular as it is able to be broken down for compact storage.



FIGURE 1.1 Standard Steam Distilling System

**Clawhammer  
Supply**

**240V Essential Oil Steam Distilling System**, The Steam Distiller system comes with the following equipment:

- (2) 8-gallon stainless steel boilers (one to be used for water and one to be used for plant material)
- (2) Sight Glass Tube which allows you to monitor the liquid level
- 2-piece column / condenser
- (2) built in safety pressure relief valves (set to 5psi)
- All necessary tri-clamps, fittings, and gaskets

- All necessary stainless pipe to attach the two boilers
- Welded 1/4" bung on the domed lid
- Welded 1/2" NPT port on boiler
- Welded 1.5" ferrule on the boiler



**FIGURE 1.2** Steam Distilling System with additional components

A number of additional accessories are available as add-on components to this standard system to make the process streamlined and more efficient. The additional components are as follows:

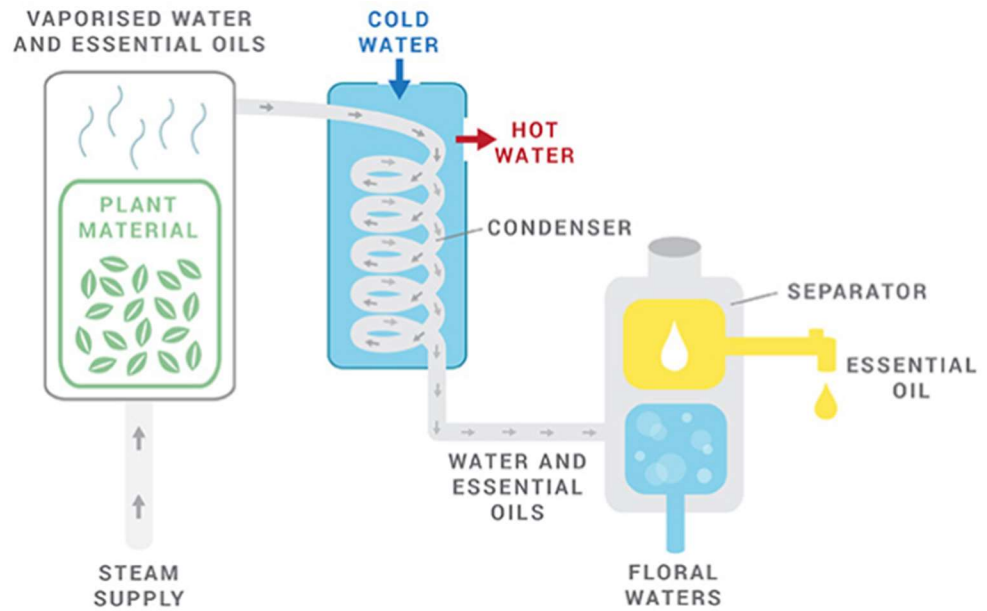
- Pressure gauges
- Boiler Thermometers
- Controller Kit
- Column Thermometer Kit
- Sight Glass K

## The Process

Once the equipment is installed and assembled the lavender essential oil extraction can begin.

1. The first step is to harvest the lavender plants. This essential oil steam distiller includes an 8-gallon stainless steel boiler for plant materials. It is estimated that approximately 13 lbs. of lavender blooms are needed to fill an 8-gallon boiler.
2. Fill the other 8-gallon boiler with water.
3. Ensure that all lids are properly sealed on boilers.
4. Turn on the boiler thermometer to begin the boiling process in the boiler that contains the water.
5. As seen in Figure 1.3; once the water is boiling, steam will travel through the insulated pipe connecting the two boilers into the boiler that contains the plant materials. The steam then circulates through the boiler with the plant material. The pressure inside the sealed boiler in conjunction with the high temperature of the steam causes the lavender bud to open and release the essential oils from the flowers. This reaction causes the extraction of the essential oil and hydrosol water from the lavender plants. The steam, essential oil and hydrosol rises through the upper column which is temperature controlled with the use of external cold water in the jacket of the condensation line.





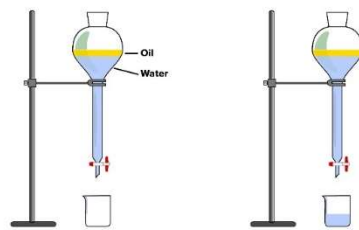
**FIGURE 1.3** detailed image of the process discussed in step 5 of the distillation process.

6. The essential oil and hydrosol releases through the condensation line and into the separatory funnel that is used as the collection vessel. Figure 1.4 displays the essential oil and hydrosol in the separatory funnel. The essential oil appears as a thick layer on the top of the murky hydrosol.



**Figure 1.4** illustrates the separation of the hydrosol and the essential oil in the collection vessel once the distillation process is complete.

7. Prior to the water boiler running dry the system will need to be shut down in order to not burn up the heating element. To shut the system down, turn off the boiler thermometer which will control the heating element portion of the distilling system. Once the system is shut down the essential oil/hydrosol mixture will need to sit for about 12 hours to settle and completely.
  
8. Once settled the use of a separatory funnel makes the separation of the essential oil and hydrosol rather easy. Since oil and water are insoluble in each other the two liquids separate into two distinct layers. As shown in figure 1.5 the funnel operates on the principle of uneven density particles within the two liquids. Hydrosol water is denser than the oil, therefore the hydrosol water may be filtered out leaving the oil layer on top.



**Figure 1.5**  
Depiction of separatory funnel with separation and removal of the two liquids (essential oil and hydrosol).

## The Products

Many lavender farmers are manufacturing and packaging their products in retail or online settings. The novelty of lavender farms is growing as the health and wellness industry is booming. Once the steam distillation process is complete and you have usable products the opportunities are as grand as the manufacturer wants them to be. Lavender hydrosol has a number of various uses in the

lavender industry. It can be packaged and sold on its own. Facial toning and skin regenerating products can be created using the hydrosol as well. Essential oils can be packaged and sold for relief of anxiety or as calming aromatherapy. Essential oils can also be incorporated in a large assortment of products such as for culinary uses, lotions, soaps, and body oils. This growing industry is only going to continue to increase its estimated revenue and market share.



**FIGURE 1.6** Various handcrafted products including essential oil, soap, and whipped body butter.

## **Summary**

The clawhammer essential oil steam distillation system is a complete system that allows for the extraction of essential oils and hydrosols from a lavender harvest. As with any high pressure and heat brewing and distilling system, safety precautions and measures must be taken to ensure the products proper use. Pressure valve releases, gauges and thermometers will aid in the end user's ability to not only remain safe throughout the use of the system but also to ensure the highest quality product can be produced.

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