

Application Note:

FRACTIONAL DISTILLATION

Often the final step in the hemp extraction process, fractional distillation has an outsized impact on product purity and potency. Fractional distillation can be accomplished using a variety of equipment like short path distillation apparatus and wiped film evaporators. The equipment used is driven by factors like desired production rate (throughput) and whether a batch or a continuous process will be used. In either case, it is critical that deep, stable vacuum be supplied to separate fractions at the lowest possible temperature. Using precise vacuum control allows for more efficient separation of plant oils and terpenes, giving you fractions that are purer and more potent.

Faster Fractions with Deep Vacuum

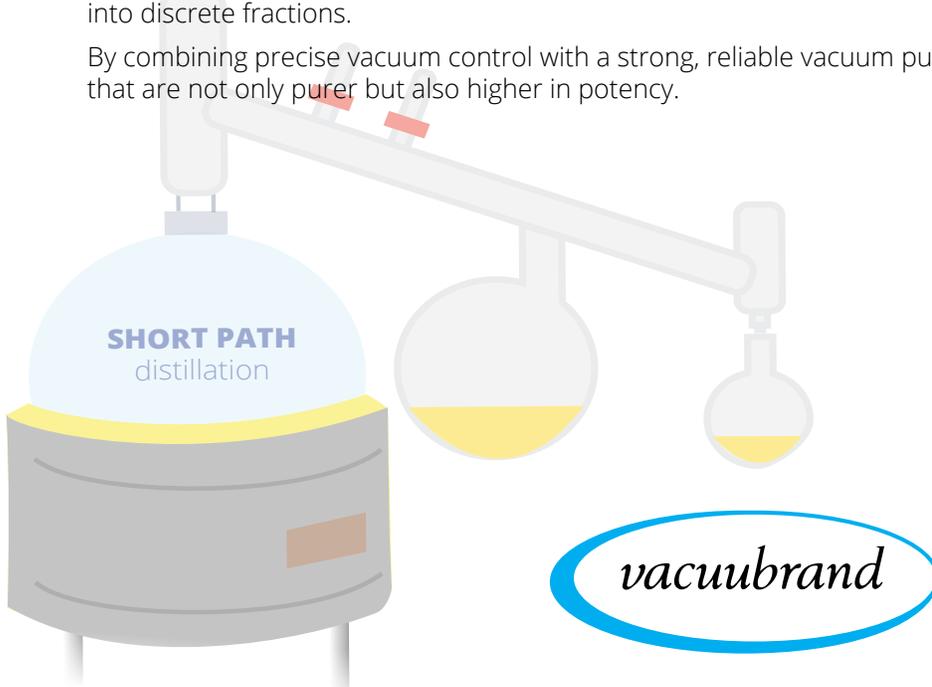
Supplying deeper vacuum to the still or reactor vessel means that fractions boil off faster. It is critical to select a vacuum pump which can provide a deep, strong vacuum. Working at a deeper vacuum level also means that the process can be completed at lower temperature. This maintains product integrity, resulting in greater potency.

Fractional distillation often uses a rotary vane vacuum pump which can supply vacuum as deep as 0.001 torr (10^{-3} torr). This is the right pressure range to distill fractions from refined hemp oil at moderate temperatures that do not cause the oil to thermally degrade. When you choose a pump for your distillation process, make sure that it provides you enough flow in the pressure range you need to work in. Review published pump curves to verify you have found the right pump, or talk with your pump manufacturer to find the right pump for your process. Remember, no two processes are exactly the same so it's always good to verify that your pump is sized correctly.

Purer Fractions with Precise Control

Just as it's important to have the right pump to supply vacuum, using the right control system is also critical. With precise control over process conditions, distilled fractions will not be pure – multiple components can, and will, boil off together. But by implementing vacuum control to hold vacuum stable in a tight range, you will be able to separate terpenes, plant oils, and contaminants into discrete fractions.

By combining precise vacuum control with a strong, reliable vacuum pump, you collect fractions that are not only purer but also higher in potency.



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Solutions for Fractional Distillation

VACUUBRAND® offers pumps and vacuum controls that are ideal for fractional distillation. Our line of compact rotary vane vacuum pumps provide strong flow even at deep vacuum levels. They will get you down to the right vacuum level quickly and minimize process time. And our intuitive, touch-screen VACUU·SELECT® controller provides precise control over the vacuum level so you can separate out terpenes from plant oils. The controller holds the right vacuum level so that you can work at a lower temperature, preventing thermal degradation and improving product potency.

RZ 2.5

2×10^{-3} torr ult. vacuum, 47 LPM

- High flow even at deep vacuum
- Compact, reliable pump

Fine Vacuum Control Package

- Collect purer fractions with precise control
- Hold the right vacuum level and keep temperature low to improve potency

Get the Right Pump for Your Purge Oven

No two processes are exactly the same. VACUUBRAND will work with you to find the right pump to meet your technical and budgetary requirements. Contact our factory-trained technical team to find the best pump for you.



SHORT PATH
distillation

vacuubrand

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