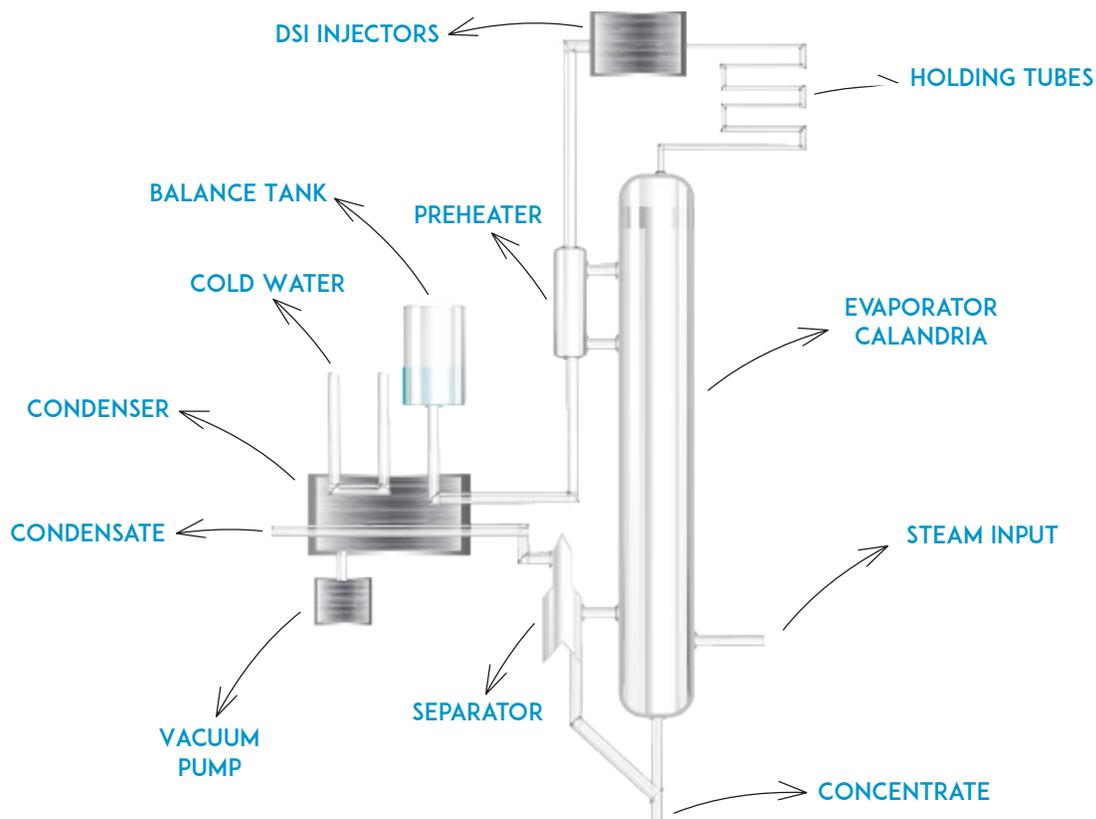


FALLING FILM EVAPORATOR

Falling film evaporators or more commonly referred to as spray evaporators are one type of tool used in chemical manufacturing for solvent recovery. In regards to the cannabis and hemp, following an ethanol based extraction the spray evaporation would be used to separate the ethanol from the cannabinoids.

This process entails the liquid tincture being dispersed using an atomizer or spray nozzle which allows for a controlled flow and consistent particle size distribution. Managing these variables maximizes the rate of heat transfer, subsequently decreasing the amount time required for solvent recovery.

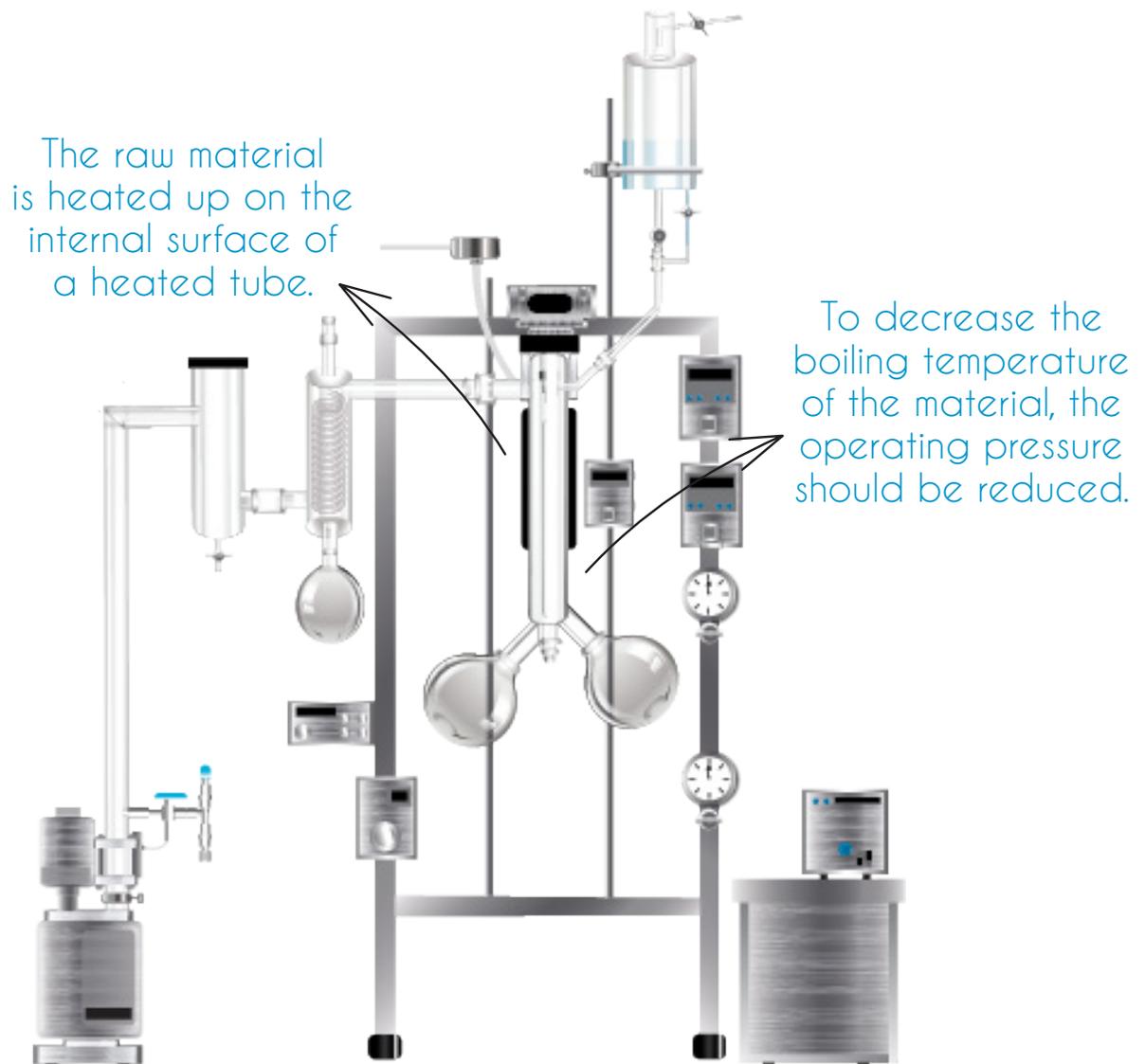


The entire process is typically performed under vacuum decreasing the required boiling point of the solvent. Simultaneously this benefits the thermally sensitive chemicals from the cannabis and hemp plants by preventing thermal degradation. Falling film evaporators scale well and are easily inserted into the concentrate manufacturing process.



MOLECULAR WIPED FILM DISTILLATION

Another vacuum distillation technique employed in the cannabinoid enrichment space is short path molecular wiped film distillation. This technique uses ultra-low vacuum, a short path distillation system, and an internal wiper. For the technique to be considered molecular distillation the vacuum pressure must be below 0.01 torr, because at this point fluids are in free molecular flow state.



The cannabinoid oil is subject to the ultra-low vacuum while then traveling across a heating element, boiling the target cannabinoid. This cannabinoid travels a short distance to the condenser and is collected in a separate flask.

