



INSTRUCTIONS

NANOSTABILIZER®-LSO

USER GUIDE:

WITH BSP-1200 PROCESSOR IN THE FLOW-THROUGH CONFIGURATION



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MATERIALS NEEDED:

- BSP-1200 ultrasonic processor configured in the flow-through mode (see BSP-1200 User Manual and BSP-1200 Peripheral Equipment Assembly Guide for details);
- Digital scale, peristaltic pump, large-capacity in-line filter assembly (housing and 1 micron cartridge);
- 25 L storage tank with mixer and valved bottom outlet, dark-glass storage container (finished product container);
- NanoStabilizer®-LSO, cannabis extract* (e.g., isolate, distillate, full-spectrum oil, etc.), distilled water.

INSTRUCTIONS FOR MAKING 10,000 ml (10 L) OF NANOEMULSION:

The instructions below detail the method for preparing 10,000 ml (10 L) of nanoemulsion with the cannabis extract concentration of **20 mg/ml**. If a different concentration is desired, use the table below and substitute the bolded numbers in the instructions with the numbers in the colored boxes.

Cannabis extract concentration in nanoemulsion**	10 mg/ml	20 mg/ml	30 mg/ml	40 mg/ml	50 mg/ml
Cannabis extract	100 g	200 g	300 g	400 g	500 g
NanoStabilizer®-LSO	400 g	800 g	1,200 g	1,600 g	2,000 g
Distilled water	9,500 g	9,000 g	8,500 g	8,000 g	7,500 g
Total	10,000 g	10,000 g	10,000 g	10,000 g	10,000 g
Number of 10 mg doses per 10,000 ml of nanoemulsion	10,000	20,000	30,000	40,000	50,000

* If your cannabis extract is solid or extremely viscous at room temperature (e.g., CBD isolate, Delta 8 THC), it may be necessary to dissolve it in a small amount of carrier oil (e.g., 1 part of MCT oil or a terpene to 3 – 4 parts of extract by weight) before processing. Heating to approximately 70 °C (158 °F) may be required to fully dissolve the extract in the carrier oil.

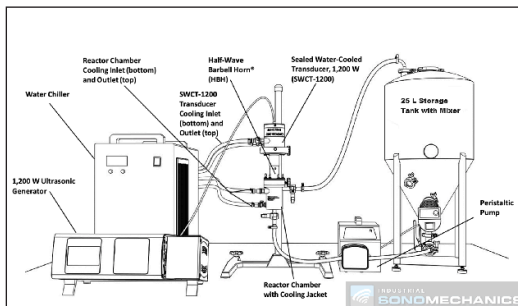
Note: We do not recommend processing extracts with high wax contents as some of the wax may remain untreated, separate from the nanoemulsion and interfere with filtration.

** If your intention is to ultimately convert this nanoemulsion into a water-soluble powder, we recommend that you stay with the **20 mg/ml** concentration, as detailed in this guide.

1

Setting up the liquid recirculation network and adding distilled water:

- a. Assemble the BSP-1200 ultrasonic processor in the flow-through mode (see BSP-1200 User Manual, BSP-1200 Peripheral Equipment Assembly Guide, and schematic on the right for details).
- b. Make sure the bottom outlet valve of the storage tank with mixer is closed.



Dispense **9 L** of distilled water into the storage tank with mixer. Start running the mixer at a high speed (80 – 100 %).

2

Adding NanoStabilizer®-LSO and cannabis extract:

- a. Place the NanoStabilizer®-LSO container on the digital scale and tear. Begin dispensing NanoStabilizer®-LSO in small portions into the storage tank with mixer, periodically placing its container back on the digital scale.
- b. Take note of the mass each time the NanoStabilizer®-LSO container is placed back on the digital scale – the negative of that number indicates how much NanoStabilizer®-LSO has been removed from the container. To ensure accurate measurement, as you get closer to your target value (**-800 g** in this case), dispense decreasingly smaller amounts. Continue this until **800 g** have been removed from the NanoStabilizer®-LSO container (the digital scale reads: "**-800 g**").
- c. Allow the contents of the storage tank with mixer to stir and disperse NanoStabilizer®-LSO until none remains floating on top.
- d. While NanoStabilizer®-LSO is being dispersed in the distilled water, begin warming your cannabis extract until it reaches about 60 °C (140 °F) and fully melts.
- e. Follow a procedure similar to 2a – 2b above to slowly dispense **200 g** of your melted cannabis extract into the storage tank with mixer.
- f. Once **200 g** of your cannabis extract has been dispensed into the storage tank with mixer, allow it to mix into the liquid until none remains floating on top.

3

Ultrasonic Processing:

In this step, ultrasonic processing will commence. Refer to BSP-1200 User Manual for operating instructions.

- a. Check that all connections in the process recirculation network are properly clamped. The liquid should be set up to flow from the bottom of the storage tank with mixer to the reactor chamber and back to the top of the storage tank with mixer (see BSP-1200 User Manual and BSP-1200 Peripheral Equipment Assembly Guide for details).
- b. Open the valve on the bottom of the storage tank with mixer. Turn the pump ON, then immediately OFF and check for any leaks in the process recirculation network. For assurance, perform this step several times. If no leaks are observed, proceed to the next step.
- c. Turn the pump ON and begin recirculating the liquid at the flow rate of 1 – 3 L/min.
- d. Turn on the water chiller and verify that the transducer and reactor chamber are being cooled correctly (see BSP-1200 User Manual for details).
- e. Set the ultrasonic amplitude to 80 % (see BSP-1200 User Manual for details). Note that this setting can be adjusted up or down to optimize the results.
- f. Initiate ultrasound and start timing. Try to maintain the processed liquid temperature at 45 – 60 °C (113 – 140 °F) throughout processing (you may temporarily disconnect the reactor chamber's cooling lines if the processed liquid becomes too cold).
- g. **i). For users with access to particle size analysis (preferred).** After processing for 2 hours, draw a sample every 10 minutes and run the droplet size analysis. Once two consecutive samples demonstrate no significant decrease in the median droplet size, deactivate ultrasound.
ii). For users without access to particle size analysis. Continue the process for about 2 hours. Deactivate ultrasound.
- h. Allow your nanoemulsion to stir, recirculate and cool for 10 minutes.
- i. Stop the pump, reverse its direction and start it again in order to collect all of the nanoemulsion from the tubing and reactor chamber into the storage tank with mixer.
- j. Stop the pump again and return its direction to the original setting.

4

Filtration:

In this step, you will use the 1 micron in-line capsule filter to remove any particulate contamination from your nanoemulsion as you collect it in the finished product container.

PARTS NEEDED:



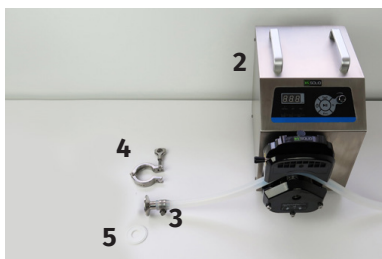
1. In-line filtration assembly with 1 micron cartridge and 1/2" sanitary fitting

2. Peristaltic pump with 1/2" ID silicone hose

3. 1/2" sanitary to 1/2" hose ID adapter

4. 1/2" sanitary clamp

5. 1/2" sanitary gasket



Click the link or scan QR code below to watch the filtration video instructions:

<https://youtu.be/NNSmQ3rN3As>





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