



INSTRUCTIONS

NANOSTABILIZER[®]-LT

USER GUIDE:
WITH LSP-600 PROCESSOR IN THE FLOW-THROUGH CONFIGURATION



INDUSTRIAL
SONOMECHANICS[®]

Sonomechanics.com

MATERIALS NEEDED:

- LSP-600 ultrasonic processor assembled in the flow-through mode (see LSP-600 User Manual and LSP-600 Peripheral Equipment Assembly Guide for details);
- Digital scale, peristaltic pump, in-line sterilizing filter (0.22 micron pore size), 10 ml vials, disposable pipettes, magnetic stirrer with hotplate, stir-bar, 200 ml beaker (pre-mix vessel), dark-glass storage container (enough to fit 1 L);
- NanoStabilizer®-LT, cannabis extract (e.g., isolate, distillate, full-spectrum oil, etc.), distilled water.

INSTRUCTIONS FOR MAKING 1000 ml (1 L) OF TRANSLUCENT NANOEMULSION:

The instructions below detail the method for preparing 1000 ml (1 L) of a translucent 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 (g)	10	20	30	40	50
NanoStabilizer®-LT (g)	50	100	150	200	250
Distilled water (g)	940	880	820	760	700
Total (g)	1,000	1,000	1,000	1,000	1,000
Number of 10 mg doses per 1,000 ml (1,000 g) of nanoemulsion	1,000	2,000	3,000	4,000	5,000

1

Mixing your cannabis extract with NanoStabilizer®-LT:

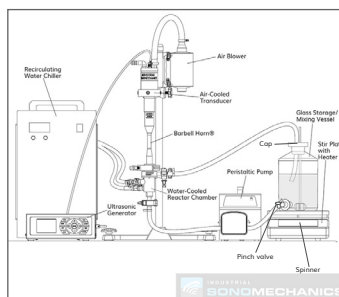
In this step, you will mix your cannabis extract with NanoStabilizer®-LT in the pre-mix vessel. We recommend that you prepare an excess (10%) of this pre-mix as some may remain in the pre-mix vessel (for future use) when transferring to the glass storage/mixing vessel (step 3). To accurately dispense **110 g** of NanoStabilizer®-LT (**100 g + 10 g** of excess) and **22 g** of your cannabis extract (**20 g + 2 g** of excess), follow the directions below.

- a. Place the pre-mix vessel with a stir-bar on the magnetic stirrer with hotplate.
- b. Place the NanoStabilizer®-LT container on the digital scale and tare. Begin dispensing small amounts from the NanoStabilizer®-LT container into the pre-mix vessel, periodically placing the NanoStabilizer®-LT container back on the digital scale. Be careful to dispense NanoStabilizer®-LT into the pre-mix vessel and not to spill it onto the inner wall or outside.
- c. Take note of the mass each time the NanoStabilizer®-LT container is placed back on the digital scale – the negative of that number indicates how much NanoStabilizer®-LT has been removed from the container. To ensure accurate measurement, as you get closer to your target value (**-110 g** in this case), dispense decreasingly smaller amounts. Continue this until **110 g** have been removed from the NanoStabilizer®-LT container (the digital scale reads: “**-110 g**”).
- d. Follow a similar procedure to accurately dispense **22 g** your cannabis extract into the pre-mix vessel.
- e. Stir the contents of the pre-mix vessel until your cannabis extract is dissolved in NanoStabilizer®-LT. Apply heat if necessary, but do not allow the liquid temperature to exceed 70 °C (158 °F).

2

Preparing the aqueous phase and setting up your process recirculation network:

- a. Assemble the LSP-600 ultrasonic processor in the flow-through mode (see LSP-600 User Manual, LSP-600 Peripheral Equipment Assembly Guide, and schematic on the right for details).
- b. Close the pinch valve at the bottom outlet of the glass storage/mixing vessel and carefully dispense **880 ml** of distilled water into the vessel.



- c. Open the pinch valve. The pump should send the liquid through the reactor chamber and then back to the top of the glass storage/mixing vessel (see above schematic). To avoid foaming, make sure that the tube returning the liquid to the glass storage/mixing vessel is submerged into the liquid by about 5 cm.
- d. Check that all connections in the process recirculation network are properly sealed. Check for any kinks in the tubing and make sure that any valves in the process recirculation network are sufficiently open for the process liquid to flow at a rate of 0.5 - 1.5 L/min (50 - 200 RPM).
- e. Turn the pump ON, then immediately OFF and check for any leaks in the process recirculation network. For assurance, preform this step several times. If no leaks are observed, proceed to the next step.
- f. Turn the pump ON and begin recirculating the water.
- g. Make sure that the cooling water lines are connected to the reactor chamber's temperature control jacket (see LSP-600 User Manual for details). Check for kinks or leaks in these lines. Do not start the chiller yet (this will be done in step 4c).

3 Mixing the oil phase into the aqueous phase in the glass storage/mixing vessel:

- a. While the distilled water is flowing through the recirculation network and being stirred on the magnetic stirrer with hotplate, place the pre-mix vessel onto the digital scale and tare.
- b. Similarly to step 2, use the negative reading on the digital scale to dispense exactly **120 g** of the oil phase from the pre-mix vessel into the glass storage/mixing vessel.
- c. Leave the stirrer running until you finish step 4e. Make sure not to introduce any air bubbles into the liquid by excessively vigorous stirring.

4 Ultrasonic Processing:

In this step, ultrasonic processing will commence. Refer to LSP-600 User Manual for operating instructions.

- a. Verify that the transducer is being cooled correctly (see LSP-600 User Manual for details).
- b. Set the ultrasonic amplitude to 80% (see LSP-600 User Manual for details). Note that this setting can be adjusted up or down to optimize the results.
- c. Initiate ultrasound and start timing and monitoring the temperature of the processed liquid. Allow the temperature of the liquid to come up to about 50 °C (122 °F) and start the chiller. Maintain the processed liquid temperature at 45 – 60 °C (113 – 140 °F) throughout processing. If the liquid becomes too cold, temporarily stop the chiller until the temperature comes back up into the specified range.

- d. After processing for an 1 hour, draw a sample into a 10 ml vial every 5 minutes and notice the degree of translucency. When two consecutive samples exhibit no difference in translucency, the ultrasonic processing is complete.
- e. Stop ultrasound and allow the nanoemulsion to recirculate and cool for 10 minutes.
- f. Turn the pump OFF, reverse its direction and turn it ON again in order to collect all of the nanoemulsion from the tubing and reactor chamber into the glass storage/mixing vessel.
- g. Turn the pump OFF and return its direction to the original setting.

5

Filtration:

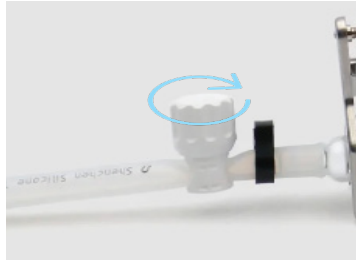
In this step, you will use the in-line sterilizing capsule filter with 0.22 micron pore size to remove any microorganisms and particulate contaminants from your nanoemulsion as you collect it in the finished product container.

PARTS NEEDED:



1. In-line sterilizing capsule filter with 1/2" sanitary fitting
2. Peristaltic pump with 1/2" ID silicone hose
3. 1/2" sanitary to 1/2" hose ID adapter
4. Sanitary clamp
5. Sanitary gasket

- a. Close the pinch valve at the outlet of the glass storage/mixing vessel by turning it clockwise.



- b. Disconnect the reactor chamber inlet and use the same gasket and clamp to assemble the hose with the inlet of the in-line capsule filter in the next step.



- c. Assemble items 1 - 5 as shown in the pictures below.



- d. Open the pinch valve by turning it counterclockwise.



- e. Using your pump at a flow rate of 100 - 150 ml/min (50-150 rpm), sterilize the nanoemulsion by passing it through the in-line capsule filter into the pre-sterilized finished product container. It is recommended to place the finished product container below the level of the filter. Once the presterilized finished product container is almost full, stop the pump and wait until the nanoemulsion stops flowing.



- f. Store the finished product container with the filtered nanoemulsion in a cool and dark place.
- g. Gently flush the in-line capsule filter by pumping distilled water through it in both directions until the water runs clean.

To re-order NanoStabilizer®-LT and replacement filters, please use the link or scan QR code below to visit our online store.

<https://sonomechanics.myshopify.com>





Sonomechanics.com