



## SuperMag Separator™ User Guide

**!WARNING!** – Ocean NanoTech’s SuperMag Separator™ has a strong magnetic field. This product should not be used near magnets, metal, credit cards, or memory storage devices. Failure to follow this warning could lead to serious injury and loss of valuable data.

### The SuperMag Separator™

The SuperMag Separator™ is designed for the separation of magnetic nanocrystals in solution using small volumes in different containers. It is easy to use and portable having a weight of 1.83 kgs (4lbs) and the dimensions 9 cm x 10 cm x 6.5 cm. The opening at the center has the strongest magnetic field designed to hold a 1 cm x 1 cm cuvette that takes a maximum of 4 mL. A pair of openings across is designed to accommodate 1.5 mL centrifuge tubes while the second pair on the other side is designed for 10 mm test tubes. All the openings can be used for simultaneous separation of multiple samples. The time required for separation increases with smaller diameter magnetic nanocrystals. This product is highly recommended for iron oxide with diameters of 10 nm and above.

During the purification process, pipet out the supernatant solution without removing the container from the magnet. It is recommended to wash the magnetic nanocrystals at least two times while the magnetic nanocrystals are attached on the wall. The SuperMag Separator™ is designed for the separation of magnetic nanocrystals from multiple samples. It has five openings designed for three different solution containers for three different volumes to meet different needs in the laboratory.

### Instructions for Separation using the SuperMag Separator™

#### Materials:

- SuperMag Separator™
- 1cm x 1cm plastic cuvette, or 10mm test tube, or 1.5mL centrifuge tube
- Magnetic crystals in solution to be separated

#### Procedure:

1. Fill the plastic cuvette, test tube, and/or centrifuge tube with nanoparticles with a concentration of  $\leq 5\text{mg/mL}$  to be separated.
2. Place the cuvette, test tube, and/or centrifuge tube into the respective insert.

NOTE: One great feature of the SuperMag Separator™ is the viewing window at the bottom of each insert. By placing the SuperMag Separator™ on a surface that will allow light to shine through the bottom, the separation will be viewable.

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3. It is important to limit the disturbance to the separation vessel once it has been put into its insert. Too much movement could weaken the separation.
4. Once the crystals have separated from the solution through magnetization resulting in attachment to the walls of the vessels used it is time to decant the supernatant and collect the crystals.
  - a. The most efficient way to decant is by using a micropipette with narrow tips.
  - b. Keep the separation vessel in its insert:  
NOTE: If the separation vessel is taken out of the insert before decanting the supernatant the particles will be dispersed into solution.
  - c. Place the pipette tip in the center of the separation vessel and draw out the supernatant. Repeat this step until all supernatant is removed and only the crystals attracted to the walls remain in the separation vessel.
  - d. Once all the supernatant has been removed and only the magnetic crystals remain, the vessel can be lifted from its insert and the crystals can be extracted.
  - e. During the purification process, pipet out the supernatant solution without removing the container from the magnet. It is recommended to wash the magnetic nanocrystals at least two times while the magnetic nanocrystals are attached on the wall. This will shorten the time needed for the purification process.
5. After the initial extraction of crystals is performed it is recommended to rinse the walls of the separation vessel thoroughly to insure that all crystals have been collected.

## SuperMag Separator™ Technical Specifications

Dimensions (H x W x D): 6cm x 10cm x 8.5cm

Weight: 1.85 kg

| Crystal Size    | 10 nm     | 20 nm     | 30 nm | 40 nm | 50 nm |
|-----------------|-----------|-----------|-------|-------|-------|
| Separation Time | Overnight | Overnight | 6 h   | 4 h   | 3 h   |

**NOTE: \*Separation Times are estimates only. Actual separation times may vary depending on concentration and size of magnetic nanocrystals.\***

**DISCLAIMER:** The SuperMag Separator™ is for research purposes only.

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