Bath Armor™ Beads

Cat. No. 42370-002	**Size: 2 L**
Cat. No. 42370-004	**Size: 4 L**
Cat. No. 42370-008	**Size: 8 L**
Cat. No. 42370-012	**Size: 12 L**
Cat. No. 42370-016	**Size: 16 L**
Cat. No. 42370-020	**Size: 20 L**
Cat. No. 41850-106	**Size: 6 L Bead Bath**
Cat. No. 41850-114	**Size: 14 L Bead Bath**
Cat. No. 41850-120	**Size: 20 L Bead Bath**
Cat. No. 41850-614	**Size: 6/14 L Bead Bath**

Description

Bath Armor™ is a dry, metallic thermal media comprised of small, uniform metal beads for replacing water in a water bath. The result is a dry bath that is far less conducive to contamination and requires less maintenance than a water-filled bath. Bath Armor™ eliminates water bath maintenance such as emptying, cleaning, monitoring, and refilling the water bath as well as the need for racks, floats & bottleneck weights.

Bath Armor™ features:

- ✓ Compatible with standard constant temperature water baths
- ✓ Compatible with a broad temperature range from -100ºC to 400ºC
- ✓ Transfers dry heat and cold with high efficiency
- ✓ Accepts and supports any size and shape vessel, including 96 well plates, Petri dishes, and other non-water-tight vessels
- ✓ Washes and disinfects easily

Tips and Hints

- ✓ Keep bath dry of liquids during use to avoid tarnishing the Bath Armor™ beads
- ✓ Wash clean of any spills with soap and water. *Completely dry* Bath Armor™ before returning to the bath
- ✓ If necessary, disinfect periodically with an ionized silver or 70% ethanol solution. Spray lightly then stir into bath.
- ✓ Avoid using strong acids, bases, including bleach solutions, and detergents
- ✓ Always use gloves when handling Bath Armor™ to avoid contaminating the bath
- ✓ For more info, visit http://www.support.labarmor.com/products.html

Installation

Use the following procedures to set up your bead bath system.

Water Baths with Recessed Elements and Thermostats (tub style bottom)

- ✓ Switch bath to OFF position, unplug, and empty water
- ✓ Clean bath thoroughly with soap and water; rinse tub with 70% ethanol and allow to *completely* dry
- ✓ Once *completely* dry, fill bath to 3/4 volume with Bath Armor™

Water Baths with Exposed Elements or Thermostats (metal plate style bottom)

- ✓ Switch bath to OFF position, unplug, and empty water
- ✓ Remove metal base plate to uncover thermostat or heating element
- ✓ Clean bath thoroughly with soap and water; rinse tub with 70% ethanol and allow to *completely* dry
- ✓ Clean metal base plate thoroughly with soap and water; rinse with 70% ethanol and allow to *completely* dry
- ✓ Once *completely* dry, first fill space beneath metal base plate with Bath Armor™ then replace the plate
- ✓ Finally, fill bath to 3/4 volume with Bath Armor™

⚠ **Caution – During bath SET-UP, Bath Armor can become extremely hot near the bath's heating element generally located at the base of the unit. Always use a stir rod to mix heated Bath Armor.**

Standard Set-up

✓ Plug in bath and switch to ON position: set bath to desired temperature
✓ Allow bath to equilibrate overnight. Bath temperature will rise 10 °C or more above set point during equilibration.
✓ Alternatively, after 5-10 min, stir briskly with a stir rod and allow bath to equilibrate 2 - 5 hours
✓ Briefly stir Bath Armor™ before and after each use

Quick Start Set-up to 37°C

✓ Set bath to 37°C; stir briskly with a stir rod after 5 - 7 minutes
✓ Switch bath to OFF position for 15 minutes
✓ Switch bath to ON position and check bath's digital temperature readout
- If <37°C, allow to heat for 0.5-2 more min, stir, switch bath to OFF position for 5 min, then switch bath to ON position and re-check bath's digital temperature readout
- If >37°C, stir bath rigorously for 1-2 min and allow bath to return to 37°C

Bath Optimization and Validation for Specific Applications

Although Bath Armor™ provides a more stable environment and constant temperature than water, in general, Bath Armor™ transfers heat more slowly. For applications involving large (≥ 500 ml) or frozen vessels, incubation in Bath Armor may take up to 2-3 times longer. Therefore, for time-sensitive applications, optimizing the bath might be required. Use the suggested optimization methods (see *Optimizing the Conditions*) described below to improve heat transfer and bath performance. The goal is to reproduce the conditions of the original experiment performed in a standard water-filled bath.

Optimizing the Conditions

For most applications, optimization is not required. But, in order to determine if bath optimization or protocol adjustments are necessary for a given application, first compare performance in both water and Bath Armor. Once a protocol is validated, in order to ensure reproducibility, always keep the established conditions constant between experiments for a given application.

✓ Nearly all water baths whether water-filled or waterless produce a slight temperature gradient of ±2 - 4°C. In water-filled baths, vessels also have an internal gradient since only a portion of the vessel is submerged and the remaining is exposed to room temperature (this often produces condensation under the lid of a vessel that contains a liquid). For applications that require more temperature uniformity, the following can be performed. First, (1) stir Bath Armor™ briefly before use by turning over from bottom to top. In a typical bath, the temperature will remain uniform for up to 8 or more hours. Second, (2) most vessels can be buried or completely submerged into Bath Armor™, which will eliminate internal temperature gradients and prevent the formation of condensation under the lid. Third, (3) *it is important to keep the bath covered* whenever possible. Reducing airflow allows for maximum temperature range and helps maintain optimal temperature uniformity.

✓ For warming larger frozen reagents such as 500 ml tissue culture serum bottles, whenever possible, first bring the vessel to 4°C or to room temperature prior to placement in the bead bath. For example, media can be brought to room temperature by allowing the bottle to rest in the refrigerator overnight or in a sterile cabinet just prior to adding to the bath. This can effectively reduce the amount of time it takes to warm a 500 ml media bottle from 1+ hours to 20-30 min. Additionally, by periodically relocating a cold bottle within the Bath Armor™, the bath is able work more efficiently, which can reduce warm up times even more.

✓ When an application requires rapid heating of a sample over a brief period, such as heat shock during bacterial transformations, simply raise the temperature of Bath Armor™ to compensate for the slower rate of heat transfer. For example, to raise the temperature of a 100-µl sample from 4°C to approximately 42°C in less than a minute, traditionally, a 42°C water bath is used. To accomplish the same results using Bath Armor™, the sample is incubated in a 50 - 55°C bead bath. For additional technical articles on the use of Bath Armor™ for common laboratory applications, please visit our support web pages at http://www.support.labarmor.com/products.html

Quality Control

Bath Armor™ is batch tested for sterility in a standard culture assay.

Notifications