Technical Support
For additional product and technical information, such as Material Safety Data Sheets (MSDS) or technical articles on the use of Lab Armor® Beads for common laboratory applications, please visit our website at www.labarmor.com. For further assistance, please email our Technical Support team at info@labarmor.com.

Notifications
The trademarks mentioned herein are the property of Lab Armor, Inc.

Lab Armor® Beads are patent pending

Lab Armor

Lab Armor® Beads in a Lab Armor Bead Bath™

Lab Armor® Beads

Cat. No.	*42370-002*	Size: 2 L
	42370-004	Size: 4 L
	42370-008	Size: 8 L
	42370-750	Size: 0.75L

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Description

Lab Armor® Beads are a dry metallic thermal alloy comprised of small, non-uniform metal beads designed to replace water in a water bath and ice in an ice bucket. The resulting dry bath is far less conducive to contamination than a water-filled bath. The recyclable beads eliminate the routine use of harmful germicides and are more energy efficient than water. Lab Armor Beads also eliminate maintenance such as emptying, cleaning, monitoring, and refilling the water bath. A bead bath naturally holds common lab vessels in place without accessories such as racks, floats and bottleneck weights. The bath can remain always-on, ready to use without the concern of evaporation.

Intended Use

For research use only. CAUTION: Not intended for human or animal diagnostic or therapeutic uses.

Features:

√ Compatible with most standard six to eight inch-deep water baths and many other constant temperature laboratory baths.
√ Compatible with a broad temperature range for use in incubators, ovens, refrigerators, and freezers. For best performance, use Lab Armor Beads at an operating temperature from -80°C to 180°C. Product fluidity may be reduced at temperatures above 180°C.
√ Transfers dry heat and cold with high efficiency to warm, thaw, incubate, and chill samples at constant temperatures.
√ Accepts and supports any size and shape vessel, including 96 well plates, Petri dishes, and other non-water-tight vessels.
√ Stays clean and disinfects easily.

Tips and Hints

√ Keep bath dry of liquids during use to avoid damaging bead performance.
√ To clean beads, see the **How to Clean the Beads** section of this manual.
√ If necessary, disinfect beads periodically with 70% ethanol solution; spray lightly then stir into bath.
√ Avoid using strong acids, bases, including bleach solutions, and detergents, which can tarnish the beads.
√ Always use gloves when handling beads to avoid contaminating the bath.
√ Beads have been shown to perform for a minimum of 2 years from date of manufacture when using good laboratory practices. If beads become dull with misuse or do not perform as intended, it is recommended to replace the beads.
√ For best performance, use product at an operating temperature of -80 to 180ºC. However, product may be used up to 300ºC without loss in thermal performance, but product fluidity may be reduced. Please contact technical services for specific recommendations.

Storage

Store at ambient temperature.

Preparation

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 up to 4 cm from top of bath with Lab Armor Beads.

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 beads then replace the plate.
√ Finally, fill bath to 3/4 volume with Lab Armor Beads.

> **Caution** – During bath Set-up, Lab Armor Beads 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 Lab Armor Beads.

Standard Set-up for Common Water Baths

√ Plug in bath and switch to ON position: set bath to desired temperature.
√ Allow bath to equilibrate overnight; bath temperature will rise 10ºC or more above set point during equilibration.
√ Alternatively, after 5 to10 minutes, stir briskly with a stir rod and allow bath to equilibrate 2 to 5 hours.
√ Briefly stir beads before and after each use .

Quick Start Set-up to 37ºC

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

How to Clean the Beads

√ To clean up spills, wash with mild detergent and water.
√ Rinse with clean water (distilled water if possible).
√ Spray with 70% ethanol and thoroughly dry.

Never use deionized (DI) water, bleach, or other cleaners that can be corrosive.

Bead Bath Use

Use the following procedures to optimize the use of your bead bath system.

Bath Optimization and Validation for Specific Applications

Although Lab Armor Beads provide a more stable environment and constant temperature than water, in general, beads transfer heat more slowly. For applications involving large (≥ 500 ml) or frozen vessels, incubation in beads may take up to 2 to 3 times longer. Therefore, for time-sensitive applications, optimizing the bath might be required. Use the suggested optimization methods (see Optimizing the Conditions) 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 in beads. 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 to 4ºC at 37ºC. 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, which can alter the concentration of the sample. For applications that require more precision, the following can be performed in a bead bath. First, 1) bury or completely submerged the vessel into Lab Armor Beads, 2) keep the bead bath covered to achieve maximum temperature range and to maintain optimal temperature uniformity.

√ For warming frozen reagents or larger refrigerated vessels such as 500 ml tissue culture media bottles, whenever possible, first bring the vessel to 4ºC or to room temperature prior to placement into the bead bath. For example, a frozen bottle of serum can first be thawed overnight in the refrigerator or tissue culture media can be brought to room temperature by allowing the bottle to rest on the bench or in a sterile cabinet prior to adding to the bath (if required, protect bottle from light). This can effectively reduce the amount of time it takes to warm a 500 ml media bottle from >1 hours to 20-30 minutes. Additionally, by periodically relocating a cold bottle within the beads, the bead 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 the bead bath to compensate for the slower rate of heat transfer. For example, to raise the temperature of a 100-µl sample from 4ºC to approximately 42ºC in less than a minute, traditionally, a 42ºC water bath is used. To accomplish the same results using Lab Armor Beads, the sample is incubated in a 50 to 55ºC bead bath.