Lab Armor® Beads

Description

Lab Armor® Beads are small, dry, non-uniform metal (comprised of metallic thermal alloy) beads designed to replace water in a water bath or 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. Lab Armor® Beads are a complement to Life Technologies' portfolio of Gibco® media, reagents, sera, and cells. For more detailed information, go to **www.lifetechnologies.com/labarmorbeads**.

Product	Catalog No.	Amount	Storage
Lab Armor® Beads	A12543-01 A12543-02	4 L 8 L	15°C to 30°C; room temperature

Product Use

For Research Use Only. Not for use in diagnostic procedures.

Important Information

- CAUTION: During bath set-up, beads can become extremely hot near the bath's heating elements generally located at the base of the unit. Always use a stir rod to mix heated beads.
- Avoid using strong acids, bases, including bleach solutions, and detergents as they could tarnish the bead's surface.
- Lab Armor® Beads have been shown to perform for a minimum of 2 years from date of manufacture when using good laboratory practices. If beads become rough, dull or do not perform as intended, we recommend replacing the beads.
- Keep bath dry of liquids during use to avoid damaging bead performance.
- Wash Lab Armor® Beads clean of any spills with soap and water; dry beads completely before returning to the bath.
- Disinfect beads periodically with 70% ethanol solution, if necessary. Spray lightly then stir into bath.
- Always use gloves when handling beads to avoid contaminating the bath.
- Circulating water baths are generally incompatible with beads. Beads may be used in shaking water baths if the bath can be operated effectively with the moving parts turned off.
- Metal dust may be observed when opening the package upon receipt. The metal dust may be present when added to the incubator bath. This is normal and will not affect product performance.

Safety Information

Read the Safety Data Sheets (SDSs) and follow the handling instructions. Wear appropriate protective eyewear, clothing, and gloves.

Use

Convert Water-Baths to Lab Armor® Beads

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

1. Switch bath to OFF position, unplug, and empty water.
2. Clean bath thoroughly with soap and water; rinse tub with 70% ethanol and allow to completely dry.
3. Fill bath with Lab Armor® Beads, once completely dry, to 1/2 to 3/4 volume or to the recommended fill volume specified by the water bath manufacturer.

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

1. Switch bath to OFF position, unplug, and empty water.
2. Remove metal base plate to uncover thermostat or heating element.
3. Clean bath thoroughly with soap and water; rinse tub with 70% ethanol and allow to completely dry.
4. Clean metal base plate thoroughly with soap and water; rinse with 70% ethanol and allow to completely dry.
5. Once completely dry, fill space beneath metal base plate with beads then replace the base plate.
6. Fill bath with beads to 1/2 to 3/4 volume or to the recommended fill volume specified by the water bath manufacturer.

Standard Set-up

1. Plug in bath and switch to ON position; set bath to desired temperature.
2. Allow bath to equilibrate overnight. Bath temperature will rise 10°C or more above set point during equilibration.
3. Alternatively, after 5–10 minutes, stir briskly with a stir rod and allow bath to equilibrate 2–5 hours.
4. Briefly stir beads before and after each use.

Quick Start Set-up to 37°C

1. Set bath to 37°C; stir briskly with a stir rod after 5–7 minutes.
2. Switch bath to OFF position for 15 minutes.
3. Switch bath to ON position and check bath's digital temperature readout:

   a. If <37°C, allow to heat for 0.5–2 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.

   b. If >37°C, stir bath vigorously for 1–2 minutes and allow bath to return to 37°C.

Bath Optimization and Validation for Specific Applications

Although 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 2–3 times longer. Therefore, for time-sensitive applications, optimizing the bath might be required. Use the suggested optimization methods (see **Optimize 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.

Optimize Conditions

Depending on the design of the thermal heating system, some baths may require raising the digital readout of the bath above the target liquid temperature to attain the desired final temperature in the process. For example, a target internal temperature of 37°C for a liquid bottle of warmed product as measured by an external thermometer may require a digital bath setpoint of 40°C and an average bead temperature above 37°C. For most applications, optimization is not required.

- 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 +/– 2–4°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, which can alter the concentration of the sample. For applications that require more precision, the following can be performed in a bead bath:

1. Bury or completely submerge the vessel into the beads
2. Keep the bead bath covered to achieve maximum temperature range and to maintain optimal temperature uniformity.

Warming Frozen Reagents or Large Refrigerated Vessels

- Bring the vessel to 4°C or to room temperature prior to placement into the bead bath.
- Thaw frozen liquids overnight in the refrigerator.
- Pre-equilibrate tissue culture media 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.
- Relocate a cold bottle within the bath and stir the beads periodically to reduce warm up times even more.

Rapid Heating of a Sample

For applications such as heat shock during bacterial transformations, simply raise the temperature of bead bath 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 beads, the sample is incubated in a 50°C to 55°C bead bath.

Limited Product Warranty

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For additional technical information such as Safety Data Sheets (SDS), Certificates of Analysis, visit www.lifetechnologies.com/support
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