

Ultra-MacroEncapsulation®

The ultimate LDR treatment of RCRA Mixed Low Level Waste debris, Radioactive Lead Solids, and. Comes in Fixed and Mobile Systems.

The Macro Solution

UltraTech's Macroencapsulation technology has been successfully used for over two decades. It has been used at numerous DOE sites and National Laboratories. Our diverse product line can accommodate direct loading of waste or waste pre-packaged in containers, such as 30- or 55-gallon drums. Our standard 6-pack box has a weight capacity of up to 45,000 lbs, but can be customized for heavier payloads. Custom size boxes can be made to allow waste filled boxes to be overpacked without repackaging. The Ultra-Macroencapsulation process is the only mobile macro system approved for lead solids.

The Macro Process and Product

The typical Macro system is comprised of two main components.

- The first component is the inner unit that is a ½" thick polyethylene macro containment liner. It has an open top to allow waste, such as, contaminated equipment and debris to be loaded directly into it or to overpack drums and overpacks.
- The second component is an outer container, typically a standard metal container, that the inner macro liner sits inside of. The void space between the inner container and outer box is pre-filled with foam or vermiculite. The system can be designed for fissile or non-fissile, Type A, LSA-1, LSA-2 or strong, tight packaging depending on the needs of the particular waste form being macroencapsulated and shipped. The steel box can be qualified for up to 45,000 lbs. Custom container can developed for higher weight capacities.

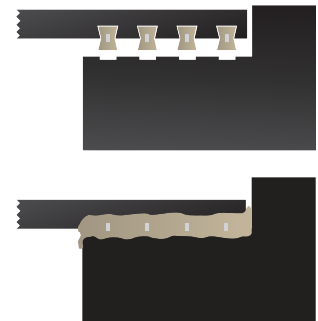
Once loaded, the void space is filled with a filler, such as vermiculite and a ½" thick polyethylene lid is lowered onto the macro unit. A resistance wire heating element is embedded in the lid perimeter and mates up with the flange on the macro container. A weight distribution device is placed on the lid and a sealing weight is placed on that.

The lid is plugged into an Encapsulation Control Unit (ECU) and a button is pushed to initiate the process. The ECU automatically selects the required voltage and amperage. The electrical current flows through the resistance wires for a predetermined duration (e.g., 20 minutes) causing them to heat up and fuse the lid to the container body. The ECU signals the process is complete and successful.

The waste is now totally isolated from potentially leaching media in the environment by a half-inch of chemically inert polyethylene.

The whole process takes about two hours from loading to ready-to-ship.

Another novel approach in using the Ultra-Macro process is to use DOT/UN approved drums or boxes on the inside of the Macro liner. The inner steel drum or box provides the credit for meeting the transportation regulations while the outer liner provides the macro treatment and no additional steel box or drum is needed external of the macro liner. This can provide significant cost savings.



Macro Sealing Illustration



Complete Unit – Ready to Ship



Click here
to see a video of the
Ultra-MacroEncapsulation
Process

Where can I use this Macro technology?

The ECU can be configured to meet your site specific power requirements and can be configured as a stationary unit (as shown the adjacent photo) or as a portable unit that can be deployed on-site or off. The ECU can be rented for short-term campaigns or purchased for longer-term use. Many sites have purchased ECUs customized to complement their operational needs.

You can ship the package waste off-site without macroencapsulating the waste first and have the macro process performed elsewhere.

A final option is to contract UltraTech to process the waste for you. The process requires very little space (less than 1000 ft²), can be performed indoors or out, and can be done with minimal training.



55-gallon model being encapsulated



Encapsulation Control Unit (ECU)

What regulations does the UltraTech Macroencapsulation Technology meet and what waste streams does it treat?

- EPA's Land Disposal Restrictions (LDRs) treatment standards for RCRA regulated debris and mixed low level debris waste.
- Approved by the State of Nevada for the treatment of debris and radioactive lead solids for disposal at the Nevada Test Site (NTS).

What are the features and benefits of the UltraTech Macroencapsulation Technology?

- Manage waste in storage at your location without repackaging it for off-site treatment.
- Select virtually any size, shape, weight rating or DOT shipping requirement to meet your specific needs.
- Overpack boxes and drums without repacking, use the same container for direct loading or design a unit to overpack contaminated pumps, piping or other awkward items.
- Loading, sealing and ready-to-ship in two hours.
- Eliminate need to repackage or directly handle waste, overpack the waste in its original shape or packaging.
- Do-it-yourself on-site for maximum savings and process control.
- Safety – The low-temperature technology eliminates fire protection and nuclear safety issues. No need for a "hot work" permit.
- Quality Assurance – UltraTech's audited NQA-1 Quality Assurance Program provides confidence that you can rely on.
- Ease-of-Use – The EPA dubbed the process "monkey welding" because even a monkey could do it.
- Standard Sizes – 55 gallon drums, 110-gallon drums, Standard Waste Box (overpacks six-55 gallon drums)

Ultra-Macro Packs

Part#	Item	Capacity	Weight Capacity	Outside Dims.	Inside Dims.
9530	Ultra-Macro Pack, 55-Gallon Model, Type A	55 gals.	840 lbs.	23-3/4" dia. x 35-1/4" h	20-3/4" dia. x 30-1/2" h
9542	Ultra-Macro Pack, 110-Gallon Model, Type A	110 gals.	800 lbs.	31-1/4" dia. x 42-1/4" h	28-1/4" dia. x 37-1/2" h
970-104-03	Ultra-Macro Pack, 6-Pack II Box Model, Type A, Non-fissile	6-Drums	8,300 lbs.	71-7/8" x 66-7/8" x 45-3/4"	86-3/4" x 61-3/4" x 41"
970-171-00	Ultra-Macro Pack, 6-Pack II Box Model, Type A, Fissile	6-Drums	12,500 lbs.	91-1/8" x 67-3/16" x 46-3/4"	87-13/16" x 63-7/8" x 42"

Custom sizes and performance standards available.