New chemical coatings technology that converts lead based paint (LBP) coated building materials into Non-RCRA hazardous materials proven successful and cost effective at the former Fort Ord Army Base in California

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ECOBOND® LBP a new chemical conversion coating, converts building materials coated with lead based paint (LBP), producing non-RCRA hazardous waste. This technology was used by demolition contractors in application on 26 buildings undergoing demolition at the former Fort Ord Army Base in California.

> ***"ECOBOND® proved itself in a demonstration on 26 buildings at Ft. Ord. The product works and offers potential for future savings."***
> Stan Cook, Project Manager, Ft. Ord Reuse Authority

Lead Based Paint (LBP) was used throughout the United States and North America until the late 1970's. Historically, there have been few economical and environmentally compliant choices for managing LBP building materials resulting in added contractor costs and environmental liabilities. Previously, either the LBP had to be removed a costly step resulting in the generation of a hazardous waste or building materials were managed and disposed of at a high cost as a regulated, hazardous waste.

A new product is available that provides a simple and cost effective solution for LBP found on:

- Wood
- Concrete
- Masonry/Brick
- Steel

ECOBOND® reduces the complexity and costs of handling and processing LBP coated materials resulting from building demolition or renovation. This new technology works through application of a paint –like coating, onto surfaces with LBP prior to demolition. The coating contains chemicals that react with the lead in the existing paint, converting the lead into a non-hazardous material. This approach eliminates the potential of generating a hazardous material before the demolition project begins.

The product is applied using standard equipment such as paint sprayers or rollers and does not require special handling procedures. No special surface preparation or regulatory permits are required as it is applied as an unregulated preventative maintenance coating. Once

Problem: LBP coated building materials handling/processing is expensive and often results in the generation of hazardous waste.

Remedy: In-place conversion of LBP into non-hazardous materials prior to demolition

Advantages:

Avoids the generation of hazardous waste

Applied in-place, and remains on surface during demolition

Reduced lead particulate dispersion during demolition

Easy application/Saves Money

Reduces environmental liability

ECOBOND® LBP is applied; it is left in-place during demolition, transportation, disposal, or material reuse.

Another benefit of this technology is that lead particulate dispersion during demolition is reduced or eliminated providing additional protection of workers. With on site air monitoring lead hazard protective measures for workers may be reduced according to appropriate local industrial and occupational health standards.

ECOBOND® LBP costs approximately $25 per gallon, provides a coverage rate of up to 200 square foot per gallon, is non-flammable and contains virtually no VOC's. The costs for applying ECOBOND® LBP are approximately the same as for a typical paint coating. As compared to other LBP removal methods (as illustrated below) or with generating and disposing of a hazardous waste this new technology can provide a 50% to 70% cost savings over traditional methods.

TYPICAL LBP METHOD PRICE COMPARISON				
	Standard Methods			**ECOBOND® LBP Methods**
	Chemical Stripper	**Abrasive Blasting**	**Encapsulation**	**ECOBOND® LBP Coating**
Cost	**$5-$8/ft^2**	**$2-$4/ft^2**	**$2-$3/ft^2**	**$0.50-$0.80/ft^2**

Inclusive of labor, equipment and material costs

Case Study:

The former Fort Ord Army installation in Marina, CA has over 1200 World War II era barracks and administrative facilities scheduled for demolition. Because of the lead in the paint, several million square feet of wood siding and concrete was going to have to be removed, transported, and disposed of as a hazardous waste under Federal and California regulatory standards. MT^2 performed extensive treatability studies on samples of the wood siding and concrete to demonstrate that ECOBOND® LBP could effectively treat the lead to below the regulatory standards. The results of these studies were presented to the regulatory agencies to gain approval for a full-scale application of the technology.

The first demolition project included 26 buildings with an average size of 10,000 square feet of floor space. Each of the buildings was sampled with an X-Ray Fraction (XRF) detector to determine the lead levels on all of the painted surfaces to determine the quantity of ECOBOND® LBP needed.

The ECOBOND® LBP product was delivered and stored on-site in 55-gallon drums. Standard Graco brand spray paint equipment was rented locally and a local paint contractor was hired to apply the product. A test patch was initially treated with a single and then a double coating of ECOBOND® and then tested prior to full-scale application. The ECOBOND® LBP was thoroughly stirred and tested with the spray equipment to ensure a controlled and even application was achieved. Application of the ECOBOND® LBP was accomplished at ground level and at elevation using a man-lift. Severe loose and peeling LBP was removed when required. No special surface preparation was required. Given the high lead

concentrations a second application was followed with a minimum drying time of six hours between coatings.

Forty-eight hours after the second coat the treated materials were sampled and analyzed to determine if they met the Environmental Protection Agency (EPA) Resource Conservation and Recovery Act (RCRA) criteria for hazardous waste. The standard for determining if material with lead is a RCRA hazardous waste is 5 ml/kg using the Toxic Characteristic Leachate Protocol, EPA method 1311. All of the materials treated with ECOBOND® LBP were less than 5 ml/kg and therefore determined not to be a RCRA hazardous waste. These results were verified with the Fort Ord Reuse Authority, EPA and State regulatory agencies, and the U.S. Army Corp of Engineers.

Demolition and removal began upon verification that the surfaces with LBP were determined to be non-hazardous materials. The Monterey Air Quality District conducted air and dust monitoring during the demolition. There were no significant detections of lead dust.

The successful application of ECOBOND® LPB eliminated the spread of lead contamination and allowed the building debris to be disposed of as a non-RCRA hazardous waste. If this building material would have been disposed of as a hazardous waste the cost would have been about $500,000 more -- a substantial savings. Federal, State of California, and local regulatory agencies oversaw the entire project from the treatability analysis to the demolition and disposal of the materials.

Concrete Treatabilty Results:

Treatabilty studies have been performed on concrete surfaces contaminated with lead. The surfaces of the concrete samples were coated with various formulations ECOBOND® LBP, On some of the samples two coats were applied. After coatings were applied and allow to dry for twenty four hours, the surface of the concrete sample was removed (using brick masonry cutting techniques) to a depth of 0.25 inch. This was to ensure that were measuring the lead contaminated portion of the sample and the analytical results were not diluted by the entire thickness of the concrete.

Type of Sample	ECOBOND® Formulation	Characteristic	Pre-Treatment TCLP Pb, mg/l	Post Treatment TCLP Pb, mg/l	RCRA Criteria 5 mg/l TCLP
Concrete	N.A.	N.A.	15.9		Fail
Concrete	LBP - 1	Two coats	15.9	<0.5	Pass
Concrete	LBP - 2	Two coats	15.9	0.7	Pass
Concrete	LBP – 3	One coat	15.9	1.2	Pass
Concrete	LBP - 4	One coat	15.9	0.5	Pass

The results of the treatabilty analysis (see table) demonstrate the ECOBOND® LBP was effective in treating concrete and masonry materials with lead based paint to below the RCRA hazardous waste standard of 5 mg/l TCLP lead. After treatment, concrete and masonry surfaces with lead based paint could be demolished, transported, disposed of, reused as a non-hazardous material.

Contact Information:

ECOBOND® LBP products are available for purchase for self-application. MT2 also offers supporting technical services such as laboratory treatability analysis, and technical field guidance. For additional information you can contact MT2 by phone at (888) 435- 6645 or visit the web site: www.mt2.com.