SAFE ENCASEMENT SYSTEMS-MIDWEST

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OPTIONS FOR THE ABATEMENT OF SURFACES COATED WITH LEAD-BASED PAINT

OPTION 1 – REMOVAL BY SCRAPING AND RE-PAINTING

The most widely practiced method of abating lead-based (LBP) paint continues to be removal by scraping followed by re-painting. Chemical strippers are frequently employed to facilitate the removal. In either case a hazardous waste is generated that must be collected and disposed of in accordance with prevailing regulations. When scraping without a chemical stripper the surface is usually wetted to prevent the creation of lead dust. Besides the generation of hazardous waste, this method of abatement suffers from the disadvantages that it is labor intensive and containment is often required to protect workers and to prevent the release of LBP into the surrounding environment. Moreover, complete removal of the LBP, especially when dealing with wood and other porous surfaces, is difficult or impossible.

OPTION 2 – REMOVAL BY BLASTING AND RE-PAINTING

A. Hazardous Waste Generation

Removal of the existing paint by sandblasting in the traditional manner generates a hazardous waste that must be contained for protection of the workers and immediate environment during the blast, then captured and disposed of in an approved hazardous waste storage site. This also requires HEPA vacuuming of the entire job site after the sand blasting has been completed. One technology that has been advocated to render the waste non-hazardous is to use a product such as Blastox or Pretox as an additive to the blast. This patented technology uses a mixture of Portland cement and calcium sulfo-aluminate with metallic oxide impregnated dust. The Portland cement works by encapsulating the metallic (lead) oxides, and by fooling the TCLP test. This occurs based on two important factors. The TCLP test uses an acid solution to encourage the rapid solution of the metal, lead in particular, and is effective because lead is amphoteric in nature, i.e. it is soluble in a water based leach test at both high and low pH's, but insoluble at neutral pH's. By the addition of the Portland cement, the pH is raised to a point where the subsequent addition of the TCLP solution only manages to bring the pH to a neutral state (approximately 7). At a pH of 7 lead oxide is naturally insoluble. This is effectively fooling the test, but not improving the risk of keeping lead from the environment. In fact the waste stream created by this approach can be considered more dangerous that with out the additive, as at its new high pH (~10) it is more water soluble! A better test is the SPLP, synthetic precipitation leach procedure. This test does not attempt to reduce the pH, but simply adds water and determines the amount that is extracted. Not only is the Portland cement approach giving a false reading by neutralizing the TCLP acid, but with it actually converting a lead-containing stream from a safe, low leaching state, to one of a higher pH, higher soluble state and actually higher leaching. In our opinion, this technology should be avoided.

An alternative technology technology for rendering the hazardous waste non-hazardous is sold under the trade name Enviroprep. It consists of a coating material that contains triple super phosphate and magnesium oxide. The phosphate converts the lead (and other metal) oxide to a phosphate, which is 1,000 to 1,000,000 times less soluble in water than lead oxide or lead hydroxide. The magnesium oxide functions as a buffer. After the coating has dried, it is removed using blasting or any other

conventional paint stripping technology; the difference being that the hazardous waste is no longer hazardous. This technology for lead fixation is greatly preferred. The EPA is currently reviewing this matter, and expectations are that the SPLP test will be used rather than the TCLP.

B. Some Limitations of Sand Blasting When Dealing With Steel Beams
Given the tight clearances frequently experienced with steel beams, it is often difficult to thoroughly blast the topside of the bottom flange because the operator will be unable to observe what he is doing. Some lead-based paint and significant rust is likely to remain on the topside of the bottom flange. Moreover, sand blasting does not effectively remove the trace amounts of soluble salts that are invariably present and which cause the corrosion. To that end, we recommend pressure washing with 1-2 percent Chlor*Rid in the wash water to reduce the surface concentration of soluble salts. Even if a high quality corrosion-inhibiting primer is used, better long-term resistance to corrosion can be expected if Chlor*Rid is used. If a solvent-based primer is used, the steel must be allowed to dry fully before priming if Chlor*Rid is used.

OPTION 3 – ENCAPSULATION

In order to achieve a long-lasting encapsulated surface, all loose, flaking paint should be removed (usually by scraping without a chemical stripper) to provide a stable surface. While this may require less labor than "complete" removal, substantial labor is still often required and a considerable amount of hazardous waste is frequently generated. Because encapsulation involves the use of a single coat, these coating materials are not likely to provide long-term protection on metal surfaces.

OPTION 4 – ENCASEMENT

Encasement requires little or no removal of LBP because the multi-surface penetrating-stabilizer (primer), SE-110-MS, stabilizes the surface by re-adhering loose-flaking paint. In general, only very loose, flaking paint need be removed. The SE-120 or SE-130 topcoat then bonds to the primer giving a tough, long-lasting, elastomeric protective system that will never crack, chip or peel. When dealing with steel, the surface should be prepared by power-washing with 1-2 percent Chlor*Rid in the wash water. The pressure washing removes any very loose, flaking paint, while the Chlor*Rid in the wash water reduces the level of the salts on the surfaces to a very low level. Because the Safe Encasement coatings are water-based, complete drying of the surface following pressure washing isn't necessary. The SE-110-MS primer, which contains corrosion-inhibitors, provides outstanding long-term protection against corrosion. The successful application of this coating system over rusty steel has been demonstrated in a large number of projects. The only hazardous waste generated is the lead-based paint that is removed by power washing, which is removed from the wash water that is collected by filtration. When dealing with masonry or concrete walls, pressure washing is recommended to remove loose, flaking paint and any efflorescence that may be present. Substantial savings in labor cost are realized by the encasement of LBP, resulting in savings of 50-80 percent in the total cost of abatement compared to removal and re-painting and significant savings compared to encapsulation.