

Application of Dry Chemical Stabilization Technology In Taiwan Kobin Bottom Ash Processing & Recycle Plant

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ABSTRACT

The Taiwan Kobin Bottom Ash Processing & Recycle Plant (Kobin-BAPRP) processes approximately one quarter million metric tons of bottom ashes from several municipal solid waste incinerators annually, generating fine aggregate finished products and ferrous recovery. The results from USEPA Method 1311 Toxicity Characteristic Leaching Procedure (TCLP) for un-treated bottom ash indicate that about 5% of the time that lead and less than 0.5% of the time, copper or cadmium may fail to meet leaching standards (i.e. 5 mg/L for Pb, 15 mg/L for Cu, and 1 mg/L for Cd). Previously, Kobin applied phosphoric acid solution for stabilization, which caused strong odor problem, increased moisture content, and still about 1% of the time that TCLP-Pb failed to pass the standard, hence, required reprocessing.

Recently, Kobin-BAPRP has switched its stabilization agent from the phosphoric acid solution to dry chemical dosage. In addition to having a better stabilized byproduct, the use of dry chemical further ensures worker safety. Dry chemical is water insoluble and fine calcium phosphate particles, with different combinations of buffers and complexing agents, such as Fe^{+2} , Fe^{+3} , Al^{+3} , or chloride. It took about 8 months for laboratory tests and plant trials to identify the optimum dosage as well as the best mixing point. Long term operation has demonstrated that dry chemical spread and mixing is safe to communities and workers, non-reactive with storage and handling materials, generates no toxic gases or odor, and most importantly, provides for effective and consistent Pb stabilization. The final stable family of mineral crystals includes complexed hydroxyapatite and chlorapatite minerals.

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