

INTEGRATED AND UNIVERSAL INTELLIGENT SYSTEM AND METHOD FOR TRANSFORMING MULTIPLE STREAMS OF INDUSTRIAL SOLID WASTES INTO LIGHTWEIGHT AGGREGATE

Abstract

The present invention relates to an integrated and universal intelligent system and production method for treating and transforming multiple streams of industrial solid wastes into lightweight aggregate (LWA), wherein said solid wastes include but are not limited to wastewater treatment sludge (WS), sewage sludge (SS), coal fly ash (CFA), coal bottom ash (CBA), and spent catalysts, all of which contain heavy metals, organic pollutants, and/or soluble salts. The system and method disclosed herein employs a proprietary algorithm expert system and an innovative microwave sintering process to transform the different streams of hazardous wastes into safe and quality lightweight aggregate (LWA) products, meeting the stringent environmental standards and utilization specifications for reuse in multiple applications, including but not limited to, replacement of aggregates in non-structural lightweight concrete (LWC) and geotechnical fill or as gardening media. Practical outcomes of this patent may include transformation of wastes into useful resources thereby achieving resource efficiency and savings from avoiding the use of virgin materials and natural resource and extending the lifespan of landfill.

Figure 2