

Recycling of Cathode Ray Tube Glasses and Utilizing the Waste Glasses in the Roof Tile Industry of Sri Lanka

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With the development of the technology the Cathode Ray Tube (CRT) monitors are being replaced by modern Liquid Crystal Display (LCD) or Light Emitting Diode (LED) display screens, transforming the used CRT monitors into a major e-waste. CRT glasses contain lead (Pb) as a constituent to an extent of 18% - 22% w/w. The emission of lead to the environment causes numerous harmful effects to the living beings. Sri Lanka has a burden of nearly 140,000 Mt of CRT glasses as e-waste and appropriate measures should be taken to dispose or recycle CRT glass waste. Current study proposes to utilize CRT waste in the roofing tile industry as a glaze or body mix. CRT glass powder was directly mixed with red clay in a range of ratios, while examining the modulus of rupture, water absorption, shrinkage and the amount of lead leaching of the glass powder and red clay mixture. The red clay was procured from the silt deposits in irrigation tanks in North Central Province of Sri Lanka. The best percentage of CRT glass powder, which was added to red clay was determined as 15%. The lead leaching rate of the material corresponds to that ratio of 15% CRT powder into red clay, retained at a rate of 0.94 ppm implying that rate of releasing lead is considerably low and it would not emerge harmful causes to the environment. The addition of CRT glass powder exhibited relatively better vitrification and finishing, depicting the potential to utilize the application in the commercial glass industry. It can be concluded that the waste CRT glasses can be utilized economically as an eco-friendly material in a novel technological way, where findings of the application of waste CRT in Roof Tile Industry.

Keywords: CRT glass, Lead, Modulus of Rupture, Red Clay, Glaze, Recycle