

Abstract

In Thailand, more than 50 percent of Thai people earn their living from agriculture, which produces many agricultural wastes. Some of these are used as a source for electricity generation, which causes a number of biomass. The ash from burning biomass is light - weight, and can easily disperse. Therefore, the proper waste management is required in order to protect the environment. Many studies showed that the biomass ash can be used in the cement production by partially replacing typical materials. This research aimed to investigate the use of biomass ash for developing mortar plastering cement with the better heat-protection property, suitable for general usage.

The objective of this research is to study the factors affecting the properties of plastering mortar in accordance with industrial standards and its heat-protection property, compared with the normal plastering mortar. The study was performed by replacing sand and cement with unground and ground biomass ash respectively in the range of 5 to 20 percent by weight.

The results indicated that the factors affecting the properties of plastering mortar were the percentage of replaced biomass ash, the grinding of biomass ash, and the mortar curing time. The increased amount of unground biomass ash caused the decrease in strength of plastering mortar, increasing in the water requirement for the mixture. When the biomass ash was ground, increasing the percentage replacement of biomass ash tends to increase the strength of plastering mortar, and reduce in the water consumption. Using biomass in the mortar mixture provided better heat-protection capability. However, the mortar with ground biomass ash had the lower heat-protection property compared to those mixed with the unground biomass ash mortar. From the results, the mixture containing 20 percent of unground biomass ash yielded the most optimal performance in terms of compressive strength and heat-protection capability.