Application of Fly Ash Carbon Treatment to Activated Carbon

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Abstract:

The Environmental Protection Agency has determined that mercury emissions for coal-fired power plants will be reduced in the near future. One of the primary means proposed for reducing emissions involves the injection of activated carbon into the flue gas stream as a mercury adsorbent. In many of the proposed mercury capture systems, the activated carbon will be collected along with the fly ash from the flue gas. Because of it high absorptive capacity for the surfactants used as air entraining admixtures, the presence of even small quantities of activated carbon may render fly ash unacceptable for use in ready mix concrete. This paper reports the results of an investigation designed to determine the impact of contamination by activated carbon on fly ash performance in air entrained concrete and to investigate a specific means for minimizing the influence of activated carbon. Results are reported from testing fly ash spiked with a number of activated carbons at various concentrations. Testing was also conducted on field samples collected during a mercury removal demonstration processes. The impact of carbon on air entrainment in mortar and concrete samples is reported. Furthermore, results are presented detailing the effectiveness of a commercially available chemical treatment. This fly ash treatment process marketed as FACT^{TM} is based on the addition of a non-surfactant, sacrificial agent that satisfies much of the activated carbons absorption capacity, thus effectively minimizing changes to the chemical air entraining admixtures concentration regardless of reasonable fluctuations in carbon reactivity. This technology is shown to be applicable to the activated carbon contaminated systems tested.