

Influence of Powder Activated Carbon (PAC) in Fly Ash on the Properties of Concrete Dataset

Dataset available at: https://digitalcommons.lsu.edu/transet_data/81/

(This dataset supports report **Influence of Powder Activated Carbon (PAC) in Fly Ash on the Properties of Concrete**)

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The related final report **Influence of Powder Activated Carbon (PAC) in Fly Ash on the Properties of Concrete**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/56555>.

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Abstract: Class C Fly Ash (CFA) is commonly used as supplementary cementitious material (SCM) in producing concrete by ready-mix concrete contractors in Arkansas. However, CFA can be used as a partial replacement of Ordinary Portland Cement (OPC) if it meets certain ASTM requirements. It is believed that the presence of powder activated carbon (PAC) in CFA increases the demand of the air-entraining agent (AEA) to achieve specified air content, and this is a concern to transportation agencies such as the Arkansas Department of Transportation (ARDOT) and concrete producers in recent years. Thus, the main goal of this research is to assess the influence of PAC in fly ash on the properties of concrete. To achieve the goal of this study, a total of 14 mixes (12 laboratory and two plant mixes) were evaluated to determine the fresh concrete properties (e.g., air content, workability, and unit weight) as well as hard concrete properties (e.g., compressive, tensile and flexural strength, modulus of elasticity, and long-term durability). Besides the Pressure Meter method, a Super Air Meter (SAM) and a Miller 400A resistivity meter were used in this study to determine the air quality and electric resistance, respectively, of the prepared fresh concrete. Two CFAs containing the different percent of PAC (i.e., 0%, 0.25%, 0.50%, and 0.75% by the mass of CFA) were used to prepare the mixes where the dosage of AEA was selected based on the manufacture recommendation. Air content measurements of two selected hard concrete mixes were also made in the laboratory. The results showed that the PAC content had a significant effect on the air content of the fresh concrete. The air contents of plant mixes agreed with those of the laboratory mixes. The SAM test was found to be an effective test method to measure the air-void quality of fresh concrete mixes; the air content and quality measurements of fresh concrete were comparable with air voids of hard concrete. The long-term durability (alkali-silica-reactivity and scaling resistance) was found to be influenced by the PAC content as well as the source of CFA. The findings of this study can help to better understand the effect of PAC content in CFAs in producing durable concrete.

Comments: Tran-SET Project: 19CASU03

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Dataset description:

This dataset contains 1 .xlsx file described below.

19CASU03_Project_Laboratory_Test_DATA.xlsx:

The .xlsx file type is a Microsoft Excel file, which can be opened with Excel, and other free available software, such as OpenRefine.

National Transportation Library (NTL) Curation Note:

As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (<https://ntl.bts.gov/public-access>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at https://digitalcommons.lsu.edu/transet_data/81 on 2021-07-15. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.