

# PROJECT FACTS

UNIVERSITY OF KENTUCKY CENTER FOR APPLIED ENERGY RESEARCH

## ENVIRONMENTAL & COAL TECHNOLOGIES

### Materials Testing Support for Industrial By-products

The Environment and Coal Technologies (ECT) Group has the capability to contract out characterization and testing services, as applied to Kentucky's industrial by-products like slags, clays, coal combustion products (CCPs) in cement, among many other types of materials. The benefit to working with a research-based entity is that in addition to providing data on performance and characterization, unexpected results that limit utilization of a material may be immediately addressed to optimize performance, as well as partnering on future research projects

Physical and chemical characterization of these materials are initiated for multiple reasons, ranging from research projects based on new ideas, to evaluating the utilization potential of a waste material, to a detailed study on the characteristics of coal combustion products with increasing depth in an ash disposal pond.

Project deliverables usually include a comprehensive report detailing specimen information, testing equipment and operating parameters, experimental procedures, any deviations from testing standards, results, and interpretation, with respect to the overall project goals.

Physical and chemical testing performed by the ECT group follow ASTM protocols and include, but are not limited to:

- X-Ray Fluorescence
- X-Ray Diffraction
- Loss-on-Ignition
- Material Density
- Laser Particle-Size Analysis
- Scanning Electron Microscope Analysis
- Compressive & Flexural Strength Analysis
- Time of Setting
- Adiabatic Calorimetry
- Paste Hydration Analysis
- Drying Shrinkage
- Mortar Air
- Resistance to Alkali Silica Reactivity
- Rapid Chloride Penetration Test
- Fresh and Hardened Concrete Properties
- Resistance to Deicer Scaling
- Resistance to Rapid Freezing & Thawing
- Resistance to Carbonation
- Sulfation Potential
- Dosage Determination of Air-Entraining Admixtures

In addition to physical and chemical testing of materials, the ECT group is highly experienced in preparing detailed literature reviews about the state of research and commercial applications about the topic in question.

#### CONTACT

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