COAL ASH

SGS can provide the technical expertise and experience to provide accurate analysis data. SGS provides the complete range of laboratory procedures to meet all your requirements whether you are a producer, transporter or consumer of coal. All laboratory analysis is performed in accordance with recognized global standards. SGS lab capabilities include:

• Ash fusion.
• Ash viscosity.
• Ash chemistry.
• Ash petrography.
• Ash resistivity.

ASH TESTING

ASH FUSION

Understanding the behavior of coal ash at high temperature is critical in determining ideal coals for steam power generation. The ash fusion test gives an indication of the softening and melting behavior of coal ash at high temperatures within the boiler. Ash fusion temperatures are determined by heating a prepared sample of molded coal in a high-temperature furnace to temperatures exceeding 1,000 oC in both reducing and oxidizing conditions. The cone or pyramid of molded ash is monitored as the temperature increases. The four critical ash softening temperatures are determined by monitoring the increasing deformation of the sample as it is heated. Ash fusion testing by SGS will provide you with a valuable tool to estimate and control the slagging potential of your coal.

ASH VISCOSITY

Ash viscometer testing allows direct measurement of the temperature-viscosity relationship of your coal and coal blends. The high temperature ash viscometer generates a curve showing the temperature-viscosity relationship as seen in figure 1. The temperature at which the viscosity begins to increase rapidly is known as the temperature

of critical viscosity (Tcv). Here slag crystallization is first likely to interfere with its flow properties. The upper limit for slag fluidity is approximately 250 poise. The temperature at which this occurs is known as the T250 temperature and it can be readily calculated from the graph in figure 1.

CHEMICAL ASH ELEMENTAL ANALYSIS

SGS maintains the technical expertise and laboratory facilities to provide you with complete ash elemental analysis. Our technicians can analyze your ash samples for the following compounds in accordance with global industry standards: SiO_2, CaO, Fe_2O_3, Al_2O_3, TiO_2, K_2O, Mn_3O_4, BaO, SrO, P_2O_5, and SO_3. Ash elemental analysis performed by qualified SGS technicians will provide a quantitative evaluation of oxides that adversely affect the ash fusion temperature within your boiler, which leads to increased slagging and fouling problems. Decreasing oxide levels

through coal selection based on reliable testing procedures will allow you to control and minimize your slagging and fouling problems.

PROXIMATE ANALYSIS

Proximate provides a good initial indication of coal or coke quality and composition. A standard proximate analysis performed provides you with accurate data for ash. The ash content of coal is the non-combustible residue left after carbon, oxygen, sulfur and water has been driven off during combustion. The remaining residue or ash is expressed as a percent of the original coal sample weight. The composition of this final ash differs from the inorganic constituents of the coal prior to incineration due to chemical changes during combustion. The total mass of ash produced can differ somewhat from those obtained in power plant furnaces because of dissimilar incineration conditions.

FLY ASH RESISTIVITY

Resistivity is a measure of how easily the fly ash or particulate acquires an electric charge. Fly ash resistivity is the primary parameter that affects electrostatic precipitator performance; for example, high resistivity particulate is difficult for electrostatic precipitators to remove because it does not acquire a charge easily, whereas very low resistive particles can lose their charge too rapidly. SGS technical experts can provide you with complete fly ash resistivity testing in accordance with recognized industry standards.

Temperature-Viscosity Relationship
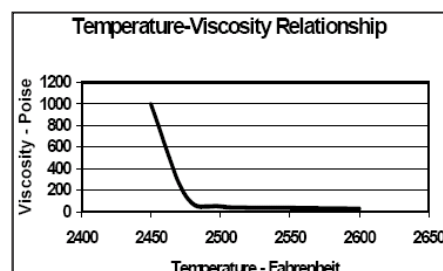
COAL PETROGRAPHY

Coal petrography is a microscopic technique used to determine a coals rank (degree of coalification) and type (amount and class of macerals). Macerals in coal are analogous to minerals in igneous rocks and are determined by examining polished specimens of minus 20 mesh prepared coal. Petrography is primarily used as a tool to evaluate bituminous coals and coal blends and their ability to produce blast furnace coke. Rank is determined by measuring the percent light reflected by the maceral vitrinite. Type is determined using a point count procedure to obtain the volume percent of the various coal macerals, or fossilized plant remains. Coal petrography can also be used to determine whether contaminants are present in the coal and to detect oxidized coal in the sample.

CONTACT INFORMATION

Email us at minerals@sgs.com
www.sgs.com/coal

WHEN YOU NEED TO BE SURE

SGS