

Coal and Ash Testing and Predictive Analyses

Understanding coal characteristics and achieving the right balance of ash resistivity is essential for optimal electrostatic precipitator performance in dust collection.

High resistivity ash makes it harder to collect ash in an electrostatic precipitator as it is more difficult to conduct electrical current through the collected dust layer. Ash with too low resistivity diminishes electrostatic precipitator performance because the dust is easily charged but loses the charge as it gets close to a grounded surface, resulting in re-entrainment as the ash flows freely through the precipitator. Finding the resistivity “sweet spot” is necessary for effective flue gas conditioning to achieve optimal collection efficiency.

Neundorfer provides testing and analyses for ash resistivity and mineral content to establish a baseline and/or to assess the effects of flue gas conditioning with SO₃ or NH₃. This particle analysis enables predictive performance modeling to:

- Better understand processes contributing to high outlet emissions (or opacity) in order to create solutions
- Deliver customized recommendations to improve ESP collection efficiency and quantify performance improvement expectations
- Establish criteria for fuel selection and other process inputs for improved precipitator performance
- Indicate adjustments to SO₃ injection to improve the effects of flue gas conditioning



Testing analysis



Complete in-house testing lab



Laboratory Services

2

TEST*	DESCRIPTION	PURPOSE	PRICE
991-1001	Resistivity determination based upon ascending and descending temperature (85 degrees C to 450 degrees C). A controlled test environment of air and one moisture concentration will be used. Electrical field to be maintained at 4kV/cm average. Assesses presence of any additives and high loss on ignition (LOI).	This is the most common test. Provides an Ascending and Descending resistivity curve.	\$1,400/Sample
<i>Additional samples up to 4 total: 2 – \$2,600, 3 – \$3,600, 4 – \$4,400</i>			
991-1006	Resistivity determination as a function of electrical field at a single temperature in a controlled environment containing a specified temperature concentration of moisture, sulfuric acid vapor or ammonia vapor (48-hour test). Test is applicable for SO ₃ or NH ₃ flue gas conditioning.	Used to model how flue gas conditioning would effect ash resistivity.	\$1,400/Sample
<i>Additional samples up to 4 total: 2 – \$2,600, 3 – \$3,600, 4 – \$4,400</i>			
991-1007	Loss on ignition (LOI) analysis	Ash analysis to determine unburned carbon content.	\$650/Sample
991-2001	Ash mineral analysis of eight (8) major elements plus MN ₃ O ₄ , BaO, SrO, P ₂ O ₅ and SO ₃ using an atomic absorption (AA) technique expressed as oxides.	This analysis can help troubleshoot resistivity issues that result from the chemistry of the ash. We can take the results of this analysis and use it as input for the resistivity model.	\$535/Sample
991-2002	Ultimate analysis identifying primary coal constituents (Oxygen, Carbon, Nitrogen, Sulfur, Hydrogen), moisture level, ash content and caloric value.	The results are used for input into combustion calculations as well as ash resistivity and ESP performance models.	\$575/Sample
991-2003	Ash particle size analysis, Coulter Counter.	Provides a particle size distribution that reports the mass and volume percentages of ash for various size ranges. These results provide guidance for ESP performance.	\$350/Sample

*These tests will be performed in the laboratory in accordance with IEEE Standard 584.

Results of analyses will be shipped twelve (12) business days from receipt of samples. Rush charges are as follows:

- Results in 3 - 5 business days = 200% of quoted price
- Results in 6 - 9 business days = 100% of quoted price

Rush request should be noted on Purchase Order. The purchaser will be billed at the rate indicated by their request, except in the case that Neundorfer, Inc. is unable to make results available within the expedited timeframe requested.

Ash and coal samples should be shipped to Neundorfer at:

Neundorfer, Inc.
Attn: Lab Services
4590 Hamann Parkway
Willoughby, OH 44094

Sampling Procedures

Ash samples from the electrostatic precipitator are required to conduct fly ash resistivity testing.

Approximately one cup of ash is needed by whichever method is used to obtain samples. Samples can be provided in three ways:

- Ash collected from each hopper in one row, in the direction of gas flow
- Blended ash sample from the ash line (if collection from individual hoppers is not possible)
- High-volume sample from the precipitator inlet (this is the ideal sample to avoid the effects of outlet alkali on ash resistivity)

For coal samples, approximately 1/2 pint of coal is required, taken from the coal pipes going into the boiler or from the feeders.

Ash and coal samples should be shipped to the Neundorfer laboratory at the address below.



NEUNDORFER
PARTICULATE KNOWLEDGE

Neundorfer, Inc. • 4590 Hamann Parkway
Willoughby, Ohio 44094 • Phone: 440-942-8990
Fax: 440-942-6824 • E-mail: solutions@neundorfer.com
www.neundorfer.com