



VANGUARD SOLUTIONS, INC.

Round Robin Quality Control Services

Vanguard Solutions, Inc. operates the largest commercial round robin coal testing program in the world under the Interlab name. Samples are provided to coal testing laboratories all over the world for analysis. Computer analysis of the data allows for rapid response, and reports are generated detailing each participant's performance as well as the group performance.

Programs available on a monthly schedule include:

- **Interlab 4**

A 4 mesh bituminous coal sample for reporting of Equilibrium Moisture percent, Air Dry Moisture Loss percent, Residual Moisture percent, D-3302 Total Moisture percent (two stage moisture test), D-2961 Total Moisture percent (single stage moisture test), Ash percent, Sulfur percent, BTU per pound, and Hardgrove Grindability Index.

- **Interlab**

A 60 mesh bituminous coal sample for reporting Total Moisture percent, Ash percent, Volatile Matter percent, BTU per pound, Sulfur percent, Free Swelling Index,

Ash Fusion Temperatures (Reducing), Ultimate Analysis (Carbon percent, Hydrogen percent, Nitrogen percent), Chlorine percent, Forms of Sulfur, Minerals in Coal Ash (Percents SiO_2 , Al_2O_3 , Fe_2O_3 , CaO , MgO , Na_2O , K_2O , TiO_2 , MnO_2 , P_2O_5).

- **Interlab West**

A sub bituminous and bituminous coal sample for reporting Total Moisture percent, Ash percent, Volatile Matter percent, BTU per pound, Sulfur percent, Free Swelling Index, Ash Fusion Temperatures (Reducing), Ultimate Analysis (Carbon percent, hydrogen percent, Nitrogen percent), Chlorine percent, Forms of Sulfur, Minerals in Coal Ash (Percents SiO_2 , Al_2O_3 , Fe_2O_3 , CaO , MgO , Na_2O , K_2O , TiO_2 , MnO_2 , P_2O_5).

- **Interlab Met**

An 8 mesh metallurgical coal sample for reporting of Gieseler Plasticity and Arnu Dilatation.

The only daily round robin coal testing programs in the industry are offered by Vanguard Solutions, Inc. through Interlab On-Line. A different sample is provided for analysis each working day. Next day reporting of quality information, including SPC charts, are provided via modem. Programs available on a daily schedule include:

- **Interlab On-Line East**

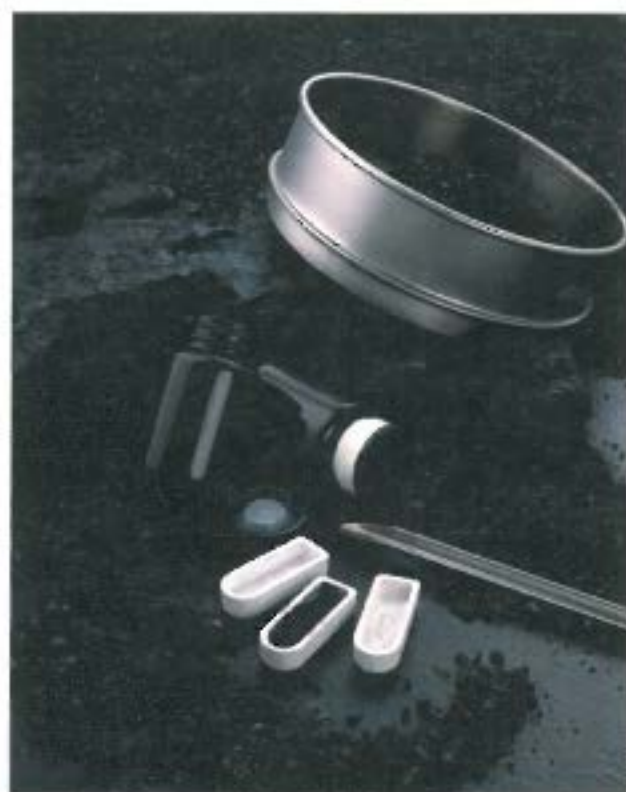
A 60 mesh bituminous coal sample for reporting of Total Moisture percent, Ash percent, Volatile Matter percent, BTU per pound, Sulfur percent, Free Swelling Index, and Ash Fusion Temperatures (Reducing).

- **Interlab On-Line West**

A 60 mesh sub bituminous and bituminous coal sample for reporting of Total Moisture percent, Ash percent, Volatile Matter percent, BTU per pound, Sulfur percent, Sodium Oxide percent, and Ash Fusion Temperatures (Reducing).

Certified Reference Materials

A variety of coal samples, certified for use as reference samples, are available from Vanguard Solutions, Inc. Each sample consists of 50 grams pulverized coal with NIST traceability and with multiple laboratory determinations. Certified reference materials are exceptionally well-suited for routine quality control checks and instrument calibration. Custom reference materials can be produced using consumer-specified coal sources, where equipment calibration customized to a primary coal source is desired.



Consulting

Vanguard Solutions, Inc. is a major provider of technical and business consulting to all areas of coal usage, from mine planning to fuel management. Consulting areas include: sampling situation evaluation, laboratory design and evaluation, data analysis, quality systems audits, vendor certification programs, expert witness deposition and testimony, litigation support services, equipment specification, procurement and installation, and mergers and acquisitions.

Bias Testing of Mechanical Sampling Equipment

Vanguard Solutions, Inc. has over twenty years experience in the design, performance and evaluation of mechanical coal sampling systems. More than 300 tests have been performed on all types of systems in a variety of situations. The innovative use of non intrusive testing methods results in less strain on coal loading and unloading systems, less site time, lower costs and more rapid turnaround of results.

International Coal Testing Conference

The International Coal Testing Conference, sponsored by Vanguard Solutions, Inc., is a symposium and exhibition that is geared to individuals with special interest in the coal testing world. The conference is tailored to the informational needs of all personnel whose jobs are related to the management of quality of coal production, utilization or research. An exhibition of state-of-the-art equipment is included as an integral part of this conference. In the past ten conferences, more than 3,300 participants from 17 countries heard over 350 technical presentations.

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