The Ash Probe

BRETBY GAMMATECH

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The Ash Probe is a hand portable instrument for measuring the ash content of piles, wagons or trucks of coal. It provides the user with quick and accurate ash readings within seconds. **It contains no radioactive sources.**

Ash Probes are in everyday operation in over twenty different countries all around the world. They withstand the extreme cold in Siberia, Canada and Spitzbergen and extreme heat in India, Vietnam, Indonesia, Iran and Africa.

General Description

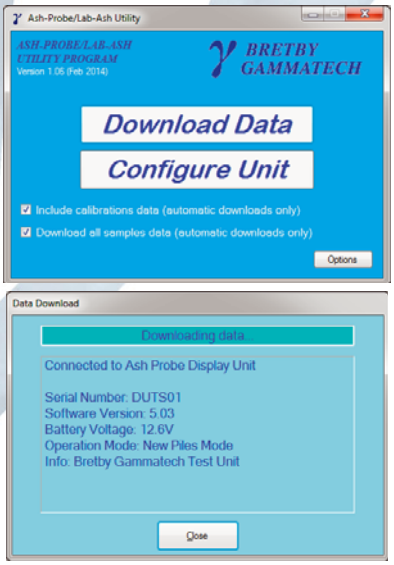
The Ash Probe comprises two parts: the Probe and the Display Unit. The newly upgraded Display Unit is now housed in a lightweight carry case incorporating a convenient shoulder carry strap, a fold away handle and removable lid for ease of use.

Ash Probe

The software has been improved so that the Ash Probe can now be configured more suitably for specific applications viz: Truck Mode, Pile Mode (new and original) and Calibration Mode.

The probe has undergone an internal upgrade and now incorporates more shock absorbing material to increase robustness. It is provided in a padded shoulder carry bag.

The ash measurement is obtained by inserting the probe into the coal and operating the Display Unit. An ash reading is displayed, the precision of which improves with measurement time. The desired precision is user selectable from four values ranging between 0.25% and 1% ash. The measurement times out once the required precision has been reached.



Bretby Utility Software

Calibration Equipment

In Pile Mode the Ash Probe is used at several locations around the pile. Up to 99 (previously 72) readings per pile can be made. Both the individual readings and the pile average ash can be displayed along with the standard error for the pile. Results from up to 99 (previously 72) piles can be displayed and stored.

Operation in Truck Mode is similar with up to 12 probings per truck and capacity to store data for up to 600 trucks. A truck reference can also be stored for traceability purposes.

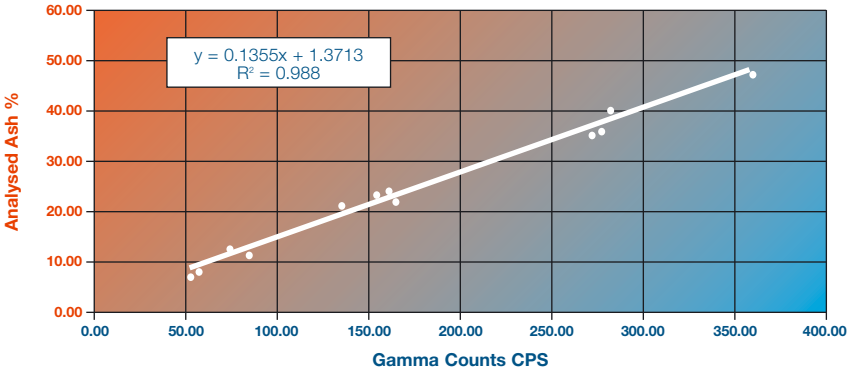
Calibration is readily achieved by the customer using the supplied sample gathering equipment. The Display Unit can store up to nine separate calibrations for different coal types.

Stored data can be transferred to a PC for off-line data archiving and analysis.

Main Features

- Simple to use
- Hand portable
- Accurate results within seconds
- In Pile Mode it provides average ashes from up to 99 measurements per pile and stores data for up to 99 piles
- In Truck Mode it provides average ashes from up to 12 measurements per truck and stores data for up to 600 trucks
- Backlit display for use in poor light
- Easy to calibrate
- Can store 9 different calibrations
- Internal rechargeable sealed lead acid battery (suitable for very low temperatures)
- Can download data to a PC (using Bretby Utility Software)

Typical Ash Probe Calibration



Accuracy

Tests on a wide range of coals from over twenty different countries on six continents have shown that the Ash Probe can provide the ash content to closer than 1% ash (1σ). In some cases better than 0.5% (1σ) accuracy has been achieved with high-grade anthracite. In general, for higher ash coal above 20% ash 2% (1σ) is more realistic.

Applications

The Ash Probe is currently being used by customers around the world to provide quick testing for the ash content of:

- Run of mine (ROM) coal
- Washed product (smalls, peas, beans, duff, singles, doubles etc)
- Screened coal (dry fines, PSF etc)
- Slurry
- Blended products
- Final product (e.g. composite ash pile)
- Discard
- Unknown coals prior to blending
- Rail or truck coal deliveries to blending plants
- Rail or truck coal deliveries to power stations, cement works and steel works
- Rail or truck coal deliveries to coking plants
- Rail or truck coal deliveries to washing plants

On-site commissioning and training is available by Bretby Gammatech engineers or their in-country agents and distributors.

Benefits

- Much quicker than conventional sampling and analysis
- More information on ash and ash variability
- Can blend more accurately, leading to a premium product
- Can dispatch more quickly, reducing train standing time
- Can increase saleable tonnage (increased yield), leading to increased revenue
- Can reduce discard, leading to reduced costs
- Reduced sampling effort, leading to reduced costs
- Can reject inferior coal deliveries or negotiate lower price

Spitzbergen: Testing coal in piles

Twin Ash Probes on a gantry, checking incoming deliveries

Vietnam: Testing coal in railway wagons

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Specifications

Principle of operation:	Natural gamma (no radioactive sources)
Power:	12V internal rechargeable battery
Battery life between charges:	up to 20 hours continuous operation
Charger:	110 - 240VAC 50-60Hz input
	13.8V, 0.3A output (2 stage)
Operational Temperature range:	-25 to +45°C
Probe Weight:	4kg
Probe dimensions (overall):	760mm long x 52mm diameter
Display Unit Weight (with lid):	4kg
Display Unit Weight (without lid):	3.5kg
Display Unit Dimensions (overall) with lid:	310mm x 230mm x 220mm
Display Unit Dimensions (overall) without lid:	310mm x 230mm x 160mm
Display type:	4 row 40 character LCD
Keyboard:	QWERTY (membrane type)
Probe-Display Unit cable length:	3m (longer if required e.g. 10m)*
Protection (lid closed):	IP65
Accuracy:	Better than 1% achieved**
Precision (user selectable):	0.25%, 0.50%, 0.75% or 1.0% ash
Measurement time:	Depends upon selected precision
Minimum measurement time:	60 seconds
Maximum measurement (user definable):	300, 400, 500 or 600 seconds
No of stored Calibrations:	up to 9
No of measurements per pile (Pile Mode):	up to 99
No of piles (Pile Mode):	up to 99
No of measurements per truck (Truck Mode):	up to 12
No of trucks (Truck Mode):	up to 600
Computer Interface:	USB or RS232
Software:	Ash Probe Utility Software

**Optional cold climate version available upon request*
***Performance in practice will depend upon operational circumstances*
Specifications are subject to change without notice.