

# Alpha Resources, Inc.

## Certificate Of Analysis

AR-2781

### ULTIMATE COAL STANDARD

LOT # 781516

LID # 781516

#### DRIED BASIS VALUES

Proximate Analysis	ASTM	Ultimate Analysis	ASTM
% Ash.....	47.09 ± 0.23 D3174/D7582	% Carbon.....	41.49±0.98 D5373
% Volatile Matter.....	23.47±1.01 D3175/D7582	% Hydrogen.....	3.08±0.25 D5373
% Fixed Carbon(calculated)	29.44 D3172	% Nitrogen.....	0.75±0.24 D5373
% Sulfur.....	2.01±0.06 D4239	% Oxygen (calculated)...	(5.58) D3176
Btu/lb.....	7409±144 D5865	MAF/DAF BTU	14005±258 D3180
Mineral Analysis	ASTM	Sulfur Forms	ASTM
Silica.....	60.15 ±2.11 D4326/D6349	% Pyritic.....	1.26±0.09 D2492
Alumina.....	21.89 ±1.46 D4326/D6349	% Organic (calculated)...	(0.45) D2492
Titania.....	1.00 ±0.16 D4326/D6349	% Sulfate.....	0.30±0.04 D2492
Ferric Oxide.....	9.58 ±0.31 D4326/D6349	 	
Calcium Oxide.....	0.45 ±0.09 D4326/D6349	Ash Fusion Temperature	Degrees F
Magnesium Oxide.....	1.67 ±0.23 D4326/D6349	ASTM D1857	Reducing
Potassium Oxide.....	4.04 ±0.10 D4326/D6349	Initial deformation...	2264
Sodium Oxide.....	0.61 ±0.12 D4326/D6349	Softening.....	2341
Sulfur Trioxide.....	0.65 ±0.11 D4326/D6349	Hemispherical.....	2439
Phosphorus Pentoxide.....	(0.08) D4326/D6349	Fluid/Final.....	2582
Strontium Oxide.....	(0.03) D4326/D6349	% Chlorine D4208/D6721	(0.08)
Barium Oxide.....	(0.12) D4326/D6349		
Manganese Oxide...	(0.06) D4326/D6349		
Undetermined (calculated)	(0)		

**REFERENCES USED: NIST SRM 2684b, 2583c, Benzoic Acid, () indicates reference only value**

**Notes:**

The material used in production of this standard was prepared and sampled in accordance with ARI 041 and ISO Guide 34. The uncertainty values represent the expanded uncertainty (k=2, two sigma, 95% confidence) obtained through analytical testing by the mentioned ASTM methods, and may not reflect your testing capabilities. Normal test procedures should be employed when using this standard; this includes using the *reproducibility* and *repeatability* factors of the method for establishing analytical uncertainty if needed. When necessary, professional judgment is applied toward consideration of data and statistical information. The statistical analysis and the overall direction and coordination of the analytical measurements leading to certification were performed by K.E. Dyer, Technical Manager at Alpha Resources.

The samples for round robin testing were selected in accordance with ARI 031. The above values relate only to the material used to produce this standard. The analytical samples should be dried or corrected for moisture as per the test method you are using. This bottle contains 50g fine coal powder (-60 mesh). Kept sealed this product has an indefinite shelf life. Once opened this certificate is valid for two years. Keep sealed tight and store under normal laboratory conditions. This certificate cannot be reproduced except in full.

Remedies for any claimed defect in this product will be limited to product replacement or refund of the purchase price. In no event shall Alpha Resources be liable for incidental or consequential damages. This is a Certified Reference Material (Working Standard) and is traceable (Sulfur) to the above mentioned NMI references. For good laboratory practice it is recommended that all standards be verified prior to use.

**EXPIRATION DATE**

**THIS CRM IS VALID FOR TWO YEARS FROM THE DATE OF OPENING**

CERTIFIED August 17, 2016

