

**Certificate of Analysis  
Part No. B2335  
Ultimate Anthracite CHNS  
Standard**

Certificate Number: 783320  
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**Dried Basis Values**

Proximate Analysis				ASTM	Ultimate Analysis			
		n=	k=				n=	k=
% Ash	20.97±0.20	8	2.4	D3174/D7582	%Carbon	72.32±1.04	8	2.4
% Volatile Matter	7.01±1.42	8	2.4	D3175/D7582	%Hydrogen	2.03±0.28	8	2.4
% Fixed Carbon (calculated)	(72.02)	--	--	D3172	%Nitrogen	0.90±0.16	8	2.4
% Sulphur	0.54±0.04	24	2.1	D4239	%Oxygen (calculated)	(3.24)	--	--
Btu/lb	11336±129	8	2.4	D5865	MAF/DAF BTU (calculated)	(14349)	--	--
				ASTM	Sulphur Forms			
Mineral Analysis		n=	k=					ASTM
%Silica	57.49±6.62	8	2.4	D4326/D6349	% Pyritic	(0.06)		D2492
%Alumina	28.41±2.99	8	2.4	D4326/D6349	%Organic (Calculated)	(0.43)		D2492
%Titania	1.98±0.12	8	2.4	D4326/D6349	%Sulphate	(0.05)		D2492
%Ferric Oxide	5.30±0.49	8	2.4	D4326/D6349				
%Calcium Oxide	0.45±0.05	8	2.4	D4326/D6349	Ash Fusion Temperature	Degrees F	Degrees F	
%Magnesium Oxide	0.70±0.04	8	2.4	D4326/D6349	ASTM D1857	Reducing	Oxidizing	
%Potassium Oxide	(3.39)	--	--	D4326/D6349	Initial deformation	(2700)	(2700)	
%Sodium Oxide	(0.43)	--	--	D4326/D6349	Softening	(2700)	(2700)	
%Sulphur Trioxide	0.27±0.11	6	2.6	D4326/D6349	Hemispherical	(2700)	(2700)	
%Phosphorus Pentoxide	(0.19)	--	--	D4326/D6349	Fluid/Final	(2700)	(2700)	
%Strontium Oxide	(0.03)	--	--	D4326/D6349				
%Barium Oxide	(0.14)	--	--	D4326/D6349	%Chlorine D4208/D6721	(0.0224)		
%Manganese Oxide	(0.03)	--	--	D4326/D6349	%Fluorine D3761/D5987	(0.0097)		
%Undetermined (calculated)	(1.16)	--	--					

REFERENCES USED: Sulphur - NIST SRM 2693, NCS FC28104; BTU - NIST 39j(Benzoic Acid); C/H/N – Phenylalanine, EDTA; Forms of Sulphur – QAR-RM-6, LQSI 140022; Mineral Analysis – NIST 634a, 2689, USGS AGV-2; Chlorine - SRM2693; Fluorine – SRM 1632d, SARM18     () Indicates reference or information only value.

The intended use of this standard is for the verification of various tests by the above-mentioned methods. Typical sample size for analytical testing and minimum size is subject to the test method and instrumentation used. The uncertainty values represent the expanded uncertainty obtained through analytical testing by the mentioned ASTM methods utilizing ANOVA, ISO Guide 35, and the Guide to Uncertainty Measurement. Metrological traceability is to the SI derived units expressed as mass fraction percent, temperature, or BTU/lb. 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 material used in production of this standard was identified in accordance with ARI-041. 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 anthracite powder (-60 mesh). Values are valid for 15 years from the date of certification. 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 Elemental Microanalysis Ltd be liable for incidental or consequential damages.

This Reference Material (RM) and is traceable to the above-mentioned references. For good laboratory practice it is recommended that all standards be verified as fit for purpose prior to use.

CERTIFIED April 15, 2020

Elemental Microanalysis Ltd