Elemental Microanalysis Ltd
1 Hameldown Road
Okehampton
EX20 1UB
United Kingdom
Telephone: 01837 54446
Fax: 01837 54544
Web: www.elementalmicroanalysis.com

Certificate of Analysis
Part No. B2329
Ultimate Coal CHNS Standard

Certificate Number: 778622

Dried Basis Values

() indicates reference or information only value

Proximate Analysis		n=	k=	ASTM	Ultimate Analysis		n=	k=	ASTM
% Ash	21.23 ± 0.29	20	2.1	D3174/D7582	%Carbon	68.21 ± 0.77	8	2.4	D5373
% Volatile Matter	16.09 ± 1.16	20	2.1	D3175/D7582	%Hydrogen	2.70 ± 0.34	6	2.6	D5373
% Fixed Carbon (calculated)	(62.68)	--	--	D3172	%Nitrogen	0.96 ± 0.11	6	2.6	D5373
% Sulphur	0.81 ± 0.04	39	2.0	D4239	%Oxygen (calculated)	(6.09)	--	--	D3176
Btu/lb	11201 ± 127	8	2.4	D5865					

Mineral Analysis		n=	k=	ASTM	Sulphur Forms		ASTM
% Silica	54.20 ± 2.82	8	2.4	D4326/D6349	% Pyritic	(0.19)	D2492
% Alumina	27.05 ± 1.69	8	2.4	D4326/D6349	% Organic (calculated)	(0.47)	D2492
% Titania	1.51 ± 0.17	8	2.4	D4326/D6349	% Sulphate	(0.15)	D2492
% Ferric Oxide	6.10 ± 0.67	8	2.4	D4326/D6349			
% Calcium Oxide	2.82 ± 0.24	8	2.4	D4326/D6349	Ash Fusion Temperature	Degrees F	Degrees F
% Magnesium Oxide	0.85 ± 0.08	8	2.4	D4326/D6349	ASTM D1857	Reducing	Oxidising
%Potassium Oxide	2.98 ± 0.52	8	2.4	D4326/D6349	Initial deformation	(2585)	(>2700)
% Sodium Oxide	0.71 ± 0.19	8	2.4	D4326/D6349	Softening	(2617)	(>2700)
% Sulphur Trioxide	2.33 ± 0.59	8	2.4	D4326/D6349	Hemispherical	(2667)	(>2700)
% Phosphorus Pentoxide	0.37± 0.03	8	2.4	D4326/D6349	Fluid/Final	(>2700)	(>2700)
% Strontium Oxide	0.07 ± 0.01	6	2.6	D4326/D6349			
% Barium Oxide	0.10 ± 0.03	8	2.4	D4326/D6349	% Chlorine D4208/D6721	(0.0388 ± 0.002)	
% Manganese Oxide	0.07 ± 0.02	8	2.4	D4326/D6349	% Fluorine D3761/D5987	(0.0139 ± 0.0058)	

REFERENCES USED: Sulphur - NIST SRM 2682c, 2692c; BTU - NIST 39j(Benzoic Acid); C/H/N – Phenylalanine, EDTA; Forms of Sulphur – QAR-CRM-6a, LQSI 140022; Mineral Analysis – NIST 1632d, 2689, 634a, USGS AGV-2; Chlorine/Fluorine – SRM 1635a, 2693, 2682b, 1632d

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-LAB-603. The samples for round-robin testing were selected in accordance with ARI-LAB-625. 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). While unable to determine a definite shelf life this reference standard should be reviewed 20 years from the date of certification. 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 Elemental Microanalysis Ltd be liable for incidental or consequential damages.

This Reference Material (RM) 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.

EXPIRATION DATE: THIS CRM IS VALID FOR TWO YEARS FROM THE DATE OF OPENING
CERTIFIED: 8th of August 2022

Elemental Microanalysis Ltd