

Coal and coke reference materials

Ultimate coals

Our ISO 9001 produced ultimate coal reference materials provide the most detailed analysis of all our coals.

The ultimate coal reference materials range has all the certification of our proximate coals (% sulfur, % ash, % volatile matter, British thermal unit/lb and % fixed carbon*), in addition to reference values for C, H, N, O*, mineral analysis (silica, alumina, titania, sulphate, ferric oxide, calcium oxide, magnesium oxide, potassium oxide and sodium oxide), ash fusion temperatures*, sulfur forms*, chlorine* and fluorine* on the certificate of analysis.

Our ultimate coal reference materials are supplied as finely ground powders, tested to ASTM specifications and are metrologically traceable through calibration to a primary standard e.g. NIST SRM 2693. This information is provided on the certificate of analysis as well as expanded uncertainty for the values certified.

Proximate Analysis				Dried Basis Values					
% Ash	21.02 ± 0.34	n= 23	k= 2.1	ASTM D3174/D7582	% Carbon	68.88 ± 1.73	n= 8	k= 2.4	ASTM D5373
% Volatile Matter	15.76 ± 0.89	23	2.1	D3175/D7582	% Hydrogen	2.76 ± 0.57	8	2.4	D5373
% Fixed Carbon (calculated)	(63.22)	...	...	D3172	% Nitrogen	1.03 ± 0.16	8	2.4	D5373
% Sulphur	0.81 ± 0.04	38	2.0	D4239	% Oxygen (calculated)	(5.5)	...	...	D3176
Butlb	11232 ± 74	8	2.4	D5865					
Mineral Analysis				Sulphur Forms					
% Silica	54.93 ± 0.83	8	2.4	ASTM D4326/D6349	% Pyritic	(0.21)	...	...	ASTM D2492
% Alumina	27.17 ± 3.16	6	2.6	D4326/D6349	% Organic (calculated)	(0.49)	...	...	D2492
% Titania	1.50 ± 0.12	8	2.4	D4326/D6349	% Sulphate	(0.11)	...	...	D2492
% Ferric Oxide	6.07 ± 1.19	8	2.4	D4326/D6349					
% Calcium Oxide	2.94 ± 0.18	8	2.4	D4326/D6349					
% Magnesium Oxide	0.85 ± 0.16	8	2.4	D4326/D6349					
% Potassium Oxide	2.89 ± 0.13	8	2.4	D4326/D6349					
% Sodium Oxide	0.64 ± 0.07	8	2.4	D4326/D6349					
% Sulphur Trioxide	(2.40)	...	...	D4326/D6349					
% Phosphorus Pentoxide	0.39 ± 0.05	8	2.4	D4326/D6349					
% Strontium Oxide	(0.07)	...	...	D4326/D6349					
% Barium Oxide	0.11 ± 0.02	8	2.4	D4326/D6349					
% Manganese Oxide	(0.07)	...	...	D4326/D6349					
ASTM D1857				Chlorine/Fluorine					
Initial Deformation	(2492)	...	...	% Chlorine	(0.0385 ± 0.004)	...	...	ASTM D4238/D6721	
Softening	(2610)	...	...	% Fluorine	(0.0113)	...	...	D3761/D5987	
Hemispherical Fluid/Final	(2657)	...	...				
Degrees F Reducing	(2700)	...	...				
Degrees F Oxidising	(2700)	...	...				

*calculated

% S	% C	% H	% N	% O*	% Ash	% Vol. matter	BTU/lb	% Fixed carbon*	Additional minerals (% / µg/g)	% Cl*	Part no.
0.41	69.69	5.09	1.00	17.5	6.31	43.54	11888	50.15	✓	0.0011	B2320
0.76	86.20	4.36	1.20	1.94	5.54	17.58	14829	76.88	✓	0.0883	B2329
0.81	68.88	2.76	1.03	5.50	21.02	15.76	11232	63.22	✓	0.0385	B2321
2.27	45.14	3.39	0.91	5.40	42.89	26.30	8097	30.81	✓	0.0769	B2322
3.04	65.03	4.38	1.23	6.99	19.33	30.37	11571	50.30	✓	0.144	B2323
5.39	55.70	4.10	1.28	9.89	23.64	32.24	10031	44.12	✓	0.0282	B2324

B2325 Ultimate coal standard CHNS reference materials set contains 1 each of the following: B2320, B2321, B2322, B2323, & B2324

The full range of coal and coke reference materials along with their current certified values can be [downloaded from our website](#).

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