

Coal and Coke Standards

Mercury in Coal (25 grams) "Chlorine Values Reference Only"

Part #	Lot #	µg/g Mercury	µg/g Chlorine	Mean Weight % Sulfur	Mean Weight % Ash
AR3701	701617	0.071	"(1645)"	1.50	4.47
AR3702	702399JRC75	0.04	"(1713)"	0.77	6.45
AR3703	703399WAL99	0.1	"(<0.01)"	0.45	7.64
AR3704	704399LIG94	0.12	"(<0.01)"	1.17	10.31
AR3705	705399BLK5	0.16	"(<0.01)"	4.71	11.8

C,H,N Coal Standards (25 grams)

Part #	Lot#	% Carbon	% Hydrogen	% Nitrogen
AR1905	Sold Out	Targeted	Replacement	Date 3/13/20
AR1906	906514	60.98	4.16	1.09
AR1907	071112	62.34	3.31	1.01
AR1908	908318	69.00	4.64	1.49

Ultra Low Sulfur Coal Standards

Part #	Lot#	% Sulfur
AR1681 (Blank)	681618	0.00
AR1682	682217	0.022
AR1683	683120	0.055
AR1684	841019	0.102
AR1685	685217	0.164

Sulfur Only Coal and Coke Standards (50 grams)

Part #	Lot #	% Sulfur
AR1700	700219	0.36
AR1701	011119	0.48
AR1702	702819	0.76
AR1703	703415	0.89

Part #	Lot #	% Sulfur
<u>AR1704</u>	704518	1.09
<u>AR1705</u>	705517	1.48
<u>AR1706</u>	706818	2.04
<u>AR1707</u>	707617	2.63
<u>AR1708</u>	708716	3.03
<u>AR1709</u>	709618	3.54
<u>AR1710</u>	710317	4.25
<u>AR1711</u>	711218	5.13
<u>AR1712</u>	712318	5.79
<u>AR1713</u>	LIG96	1.18
<u>AR1714</u>	714416	1.71
<u>AR1715</u>	715617	7.06
<u>AR719</u>	191109	0.61
<u>AR720</u>	720317	0.77
<u>AR723</u>	723110	0.47
<u>AR724</u>	724517	1.21
<u>AR2712</u>	7120497	0.43

Part #	Lot #	% Sulfur
<u>AR2713</u>	131217	0.49
<u>AR2714</u>	714318	0.88
<u>AR2715</u>	715901	1.20
<u>AR2716</u>	716703	2.47
<u>AR2717</u>	717102	2.21
<u>AR2719</u>	719611	2.58
<u>AR2720</u>	201013	4.34
<u>AR2721</u>	211018	5.43

The Ultimates (50 grams)

	Met Coke AR2771	Met Coke AR2772	Coal AR2773	Coal AR2775	Coal AR2776	Coal AR2778	Coal AR2780	Coal AR2781	Coal AR2782	Anthracite AR2783
Lot#	711014	772914	773913	751219	776419	778418	780320	781918	782118	783320
% Ash	7.53	9.35	5.03	6.31	10.02	5.54	19.33	42.89	23.64	20.97
% Vol.	(0.79)	(0.47)	29.48	43.54	35.80	17.58	30.37	26.30	32.24	7.01
% Fixed C	(91.68)	(90.18)	65.49	(50.15)	(54.18)	(76.88)	(50.30)	(30.81)	44.12	(72.02)
BTU	13178	12871	12572	11888	12533	14829	11571	8097	10031	11336
% Sulfur	0.57	0.77	0.52	0.41	1.12	0.76	3.04	2.27	5.39	0.54
% Carbon	89.89	88.69	79.7	69.69	71.57	86.20	65.03	45.14	55.70	72.32
% Hydrogen	(0.23)	(<0.1)	3.13	5.09	4.80	4.36	4.38	3.39	4.10	2.03
% Nitrogen	1.08	1.10	0.64	1.00	1.26	1.20	1.23	0.91	(1.28)	0.90
% Chlorine	(0.024)	(0.026)	(<0.01)				(0.144)		(0.0282)	(0.0224)
% Oxygen	(0.70)	(<0.01)	10.98	(17.5)	(11.23)	(1.94)	(6.99)	(5.40)	(9.89)	(3.24)
<i>(Values inside) Indicates Reference ONLY</i>										

Sulfur Forms										
% Pyritic	(<0.01)	(0.01)	(0.06)	(0.02)	0.36	0.13	(1.03)	0.34	1.40	(0.06)
% Sulfate	(<0.01)	(<0.01)	(0.43)	(0.01)	0.18	0.09	(1.00)	0.82	0.35	(0.05)
% Organic	0.57	(0.76)	(0.03)	(0.38)	(0.58)	(0.54)	(1.01)	0.75	(0.52)	(0.43)
<i>(Values inside) Indicates Reference ONLY</i>										
Mineral Analysis										
Phosphorus Pentoxide	0.34	0.35	0.48	0.55	0.36	(0.08)	(0.28)	0.44	(0.07)	(0.19)
Silica	49.99	53.92	27.3	27.05	44.20	34.75	48.53	51.53	60.54	57.49
Ferric Oxide	15.88	8.66	7.33	4.79	10.22	13.60	17.18	11.27	9.44	5.30
Alumina	25.83	28.26	16.15	15.35	22.57	20.13	24.10	25.96	19.91	28.41
Titania	1.35	1.59	0.92	1.24	1.23	1.10	1.21	1.23	9.44	1.98
Sulfur Trioxide	(1.68)	(0.79)	19.17	14.99	(9.30)	13.45	(1.86)	2.58	(0.72)	0.27
Potassium Oxide	1.80	1.96	0.31	(0.40)	1.90	1.13	2.57	2.55	3.55	(3.39)
Sodium Oxide	0.81	0.54	1.82	1.79	0.60	0.46	(0.41)	(0.36)	0.57	(0.43)
Calcium Oxide	2.85	1.91	19.36	25.55	6.99	12.76	1.62	2.54	0.50	0.45
Magnesium Oxide	1.16	0.95	5.24	(0.03)	2.05	1.85	0.86	0.97	1.48	0.70
Strontium Oxide	(0.13)	(0.13)	0.39	(0.51)	0.14	0.30	(0.06)	0.09	(0.04)	(0.03)
Barium Oxide	(0.21)	(0.17)	0.51	0.61	0.27	0.23	(0.07)	<0.01	0.14	(0.14)

Manganese Oxide	(0.12)	(0.09)	0.03	(0.03)	(0.02)	0.06	(0.04)	0.02	0.05	(0.03)
Undetermined	(0.85)	(0.68)	0.99	(0.44)	(0.15)	(0.1)	(1.21)	0.46	(2.03)	(1.16)
<i>(Values Inside) Indicates Reference ONLY</i>										
Ash Fusion Temperature										
Lot #	711014	772914	773913	751219	776419	778418	780320	781411	781918	783320
Initial Reducing	2169	2606	2065	(2283)	2181	2201	(2103)	2404	2231	(2700)
Initial Oxidizing	2495	>2700	2163	(2261)	2303	2378	(2515)	2563	2443	(2700)
Softening Reducing (H=W)	2365	>2700	2105	(2309)	2254	2346	(2277)	2467	2346	(2700)
Softening Oxidizing (H=W)	2549	>2700	2201	(2312)	2354	2427	(2566)	2620	2564	(2700)
Softening Reducing (H=1/2W)	2449	>2700	2130	(2313)	2292		(2402)	2533	(2700)	(2700)
Softening Oxidizing (H=1/2W)	2589	>2700	2226	(2328)	2407		(2592)	2664	(2700)	(2700)
Fluid - Reducing	2527	>2700	2185	(2319)	2360	2437	(2510)	2597	(2700)	(2700)
Fluid - Oxidizing	2635	>2700	2275	(2328)	2464	2496	(2642)	<2700	2667	(2700)

Petroleum Coke (50 Grams)

Reference	AR742B	AR744	AR745	AR747	AR756
Lot #	742815	744216	745418	747919	561117
% Sulfur	1.11	2.50	0.49	3.66	5.00
% Ash	(0.12)	(0.27)	(0.09)	0.41	(0.60)
% Vol. Matter	11.78	(0.57)	5.79	10.97	6.85
BTU	15,636	13,939	14,861	14,919	14,204
Fixed C%	(88.10)	(99.16)	(94.12)	(88.62)	(92.55)
% C	91.39	96.21	95.92	88.46	87.89
% H	3.83	(0.22)	1.91	3.11	1.89
% N	1.83	1.03	0.80	1.45	1.79
Ni	250 ppm ug/g	143 ppm ug/g	(93) ug/g	203 ug/g	281 ppm ug/g
Fe	221 ppm ug/g	855 ppm ug/g	227 ug/g	492 ug/g	282 ppm ug/g
V	124 ppm ug/g	230 ppm ug/g	(40) ug/g	794 ug/g	1651 ppm ug/g
Ca	44 ppm ug/g	83 ppm ug/g	(34) ug/g	241 ug/g	91 ppm ug/g
Si	34 ppm ug/g	0.131 ug/g	(64) ug/g	418 ug/g	343 ppm ug/g

Prox Coal and Coke Standards

Part #	Lot #	% Sulfur	% Ash	% Vol. Matter	BTU	Fixed C
AR1720	720220	0.41	6.31	43.54	11888	(50.15)
AR1721	721913	0.52	5.03	29.48	12572	65.49
AR1722	722719	1.12	10.02	35.80	12533	(54.18)
AR1723	723320	0.85	8.16	45.13	11278	(46.71)
AR1724	241014	1.42	17.26	32.27	12216	50.47
AR1726	726516	2.01	47.09	23.47	7409	29.44
AR1729	729320	3.04	19.33	30.37	11571	(50.30)
AR1730	730219	5.38	23.64	32.24	10031	(44.12)
AR1731	311014	1.80	41.64	26.39	8377	31.97
AR1732	732520	6.55	46.00	21.7	6826	(32.3)
AR1733	733420	0.54	20.97	7.01	11336	
AR1933	TEXLIG896	0.61	7.56	36.31	13181	56.13
AR732	732514	0.47	6.57	1.15	13242	92.28
AR733	711014	0.57	7.53	(0.79)	13178	(91.68)
AR734	734914	0.77	9.35	(0.47)	12871	(90.18)

Mineral Analysis for Coal

Reference	AR2752A	AR2753	AR2754	AR2755	AR2760
Lot#	752102	753716	754714	755898	90
Silicon Dioxide	40.10	27.30	48.91	40.96	49.48
Aluminum Dioxide	14.44	16.15	23.92	13.29	27.36
Titanium Dioxide	1.98	0.92	1.20	0.82	1.33
Ferric Oxide	4.89	7.33	18.78	37.10	15.16
Calcium Oxide	20.84	19.36	1.04	1.76	1.07
Magnesium Oxide	4.59	5.24	0.85	0.56	0.77
Potassium Oxide	0.26	0.31	2.37	1.22	2.47
Sodium Oxide	0.33	1.82	0.23	0.39	0.16
Sulfur Trioxide	10.45	19.17	1.28	0.74	0.39
Phosphorus Pentoxide	0.30	0.48	0.22	0.19	0.30
Strontium Oxide	0.09	0.39	0.06	0.02	0.07
Barium Oxide	0.07	0.51	0.09	0.11	0.00
Manganese Oxide	0.03	(0.03)			
Undetermined		(0.99)	1.01	0.00	1.33
Ash Content of Whole Coal	Not Determined	5.03	23.69	Not Determined	15.00

