

Mercury In Coal Standards (25 Grams)

Part #	Lot #	$\mu\text{g/g}$ Mercury	$\mu\text{g/g}$ Chlorine	Mean Weight % Sulfur	Mean Weight % Ash
AR-3701	701399JRC100	0.06	"(1562)"	1.04	7.22
AR-3702	702399JRC75	0.04	"(1713)"	0.77	6.45
AR-3703	703399WAL99	0.1	"(<0.01)"	0.45	7.64
AR-3704	704399LIG94	0.12	"(<0.01)"	1.17	10.31
AR-3705	705399BLK5	0.16	"(<0.01)"	4.71	11.8

"Chlorine values reference only"

C,H,N Coal Standards (25 Grams)

Part #	Lot #	% CARBON	% HYDROGEN	% NITROGEN	(Reference Only)
AR-1905	905212	77.1	1.88	(1.0)	
AR-1906	061008	64.22	4.49	1.31	
AR-1907	907408	62.99	3.81	1.11	
AR-1908	908311	67.45	4.03	1.25	

Ultra Low Sulfur Coal

Part #	Lot #	% SULFUR
AR-1681 (Blank)	681610	0.00
AR-1682	682610	0.022
AR-1683	683610	0.049
AR-1684	684610	0.101
AR-1685	685610	0.143

Sulfur Only Coal & Coke Standards (50 Grams)

Part #	Lot #	% SULFUR	Part #	Lot #	% SULFUR	Part #	Lot #	% SULFUR	Part #	Lot #	% SULFUR
AR-1700	700212	0.30	AR-1707	071109	2.34	AR-719 (MET COKE)	191109	0.61	AR-2716 (GR PET COKE)	716703	2.47
AR-1701	701210	0.53	AR-1708	708911	2.83	AR-720 (MET COKE)	720210	1.21	AR-2717 (GR PET COKE)	717102	2.21
AR-1702	702311	0.72	AR-1709	SOLD OUT	RESTOCK 7/2012	AR-723 (MET COKE)	723110	0.47	AR-2719 (CAL PET COKE)	719611	2.58
AR-1703	031011	0.83	AR-1710	710211	4.15	AR-2712 (CAL PET COKE)	7120497	0.43	AR-2720 (GR PET COKE)	747308	3.99
AR-1704	704711	1.01	AR-1711	711209	5.52	AR-2713 (GR PET COKE)	N/A	NO LONGER AVAILABLE	AR-2721 (GR PET COKE)	211201	5.56
AR-1705	705312	1.43	AR-1712	712212	6.24	AR-2714 (GR PET COKE)	714CHAL	0.906	AR-2722 (CAL PET COKE)	SEE AR2719	
AR-1706	706410	1.8	AR-1713 Lignite	LIG96	1.18	AR-2715 (GR PET COKE)	715901	1.20	AR-2723 (GR PET COKE)	ST70098	5.16

Chlorine In Coal Standards (50 Grams)

Part #	Lot #	% CHLORINE
AR-1910	N/A	N/A
AR-1911	N/A	N/A
AR-1912	N/A	N/A

Chlorine in coal standards removed due to analytical inconsistencies.

The "Ultimates" (50 Grams)										
	MET COKE	MET COKE	COAL	COAL	COAL	COAL	COAL	COAL	COAL	ANTHRACITE
	<u>AR-2771</u>	<u>AR-2772</u>	<u>AR-2773</u>	<u>AR-2775</u>	<u>AR-2776</u>	<u>AR-2778</u>	<u>AR-2780</u>	<u>AR-2781</u>	<u>AR-2782</u>	<u>AR-2783</u>
Lot #	771311	721009	773409	775309	776711	778110	780408	781411	821008	783410
% Ash	8.04	9.57	7.33	6.23	20.57	28.67	22.86	17.98	12.03	17.58
% Vol.	0.85	0.42	42.96	43.25	23.01	20.14	25.99	26.33	38.22	6.08
% Fixed C	91.11	90.01	49.71	50.52	56.42	51.19	51.15	55.69	49.75	76.34
BTU	13123	12878	11195	11749	12034	10498	11255	11949	11333	11990
% Sulfur	0.6	0.76	0.56	0.29	0.84	0.68	3.42	1.91	5.06	0.55
%Carbon	90.33	87.26	66.91	69.32	68.65	62.34	62.99	67.68	64.22	77.07
% Hydrogen	<0.5	(0.29)	4.38	4.51	3.94	3.31	3.81	3.97	4.49	1.88
% Nitrogen	1.17	1.13	1.00	0.87	1.18	1.01	1.11	1.29	1.31	1.02
% Chlorine	0.05	0.02	<0.01	<0.01	0.14	0.1	0.16	0.12	NA	0.01
%Oxygen	<0.5	0.99	19.82	18.78	4.82	4.03	NA	7.17	12.89	1.9

reference only

Sulfur Forms										
% Pyritic	0.02	<0.01	0.03	0.02	0.04	0.10	1.43	0.34	0.76	0.07
% Sulfate	<0.01	0.76	0.13	0.01	0.29	0.02	0.91	0.82	1.95	0.43
% Organic	0.58	<0.01	0.40	0.26	0.51	0.56	1.08	0.75	2.35	0.05

Mineral Analysis										
Phosphorus Pentoxide	0.25	0.34	1.29	0.88	0.13	0.19	0.20	0.44	0.12	0.16
Silica	46.59	51.60	27.75	34.1	61.14	43.71	49.49	51.53	40.6	56.79
Ferric Oxide	15.97	11.74	5.63	5.26	4.86	24.13	18.42	11.27	33.43	5.2
Alumina	26.63	28.51	14.64	17.00	26.80	17.10	24.58	25.96	17.08	29.58
Titania	1.42	1.54	1.17	1.35	1.49	1.18	1.25	1.23	0.87	2.33
Sulfur Trioxide	1.99	0.84	17.82	10.85	0.53	3.40	1.06	2.58	2.09	0.37
Potassium Oxide	1.74	1.91	0.26	0.42	2.96	1.46	2.62	2.55	2.08	3.06
Sodium Oxide	0.65	0.49	0.47	1.66	0.27	0.24	0.18	0.36	0.21	0.41
Calcium Oxide	3.00	1.83	24.02	22.24	0.58	5.85	1.15	2.54	NA	0.6
Magnesium Oxide	1.19	0.90	5.99	5.19	1.13	1.29	0.87	0.97	0.93	0.83
Strontium Oxide	0.11	0.11	0.42	0.28	0.04	0.05	0.05	0.09	0.01	0.03
Barium Oxide	0.17	0.16	0.60	0.69	0.03	0.06	0.09	<0.01	0.06	0.14
Manganese Oxide	0.10	0.10	0.01	0.01	0.02	0.23	0.03	0.02	0.02	0.03
Undetermined	0.29	<0.01	-	0.08	0.02	1.01	0.00	0.46	0.39	0.47

Ash Fusion Temperature										
	<u>AR-2771</u>	<u>AR-2772</u>	<u>AR-2773</u>	<u>AR-2775</u>	<u>AR-2776</u>	<u>AR-2778</u>	<u>AR-2780</u>	<u>AR-2781</u>	<u>AR-2782</u>	ANTHRACITE <u>AR-2783</u>
Lot #	771311	721009	773409	775309	776309	778110	780408	781411	821008	783410
Initial Reducing	2275	2492	2155	2114	2633	2031	2163	2404	1972	2640
Initial Oxidizing	2575	2661	NA	NA	N/A	2363	2538	2563	NA	2730
Softening Reducing (H=W)	2340	2611	2165	2125	2693	2074	2370	2467	1988	2670
Softening Oxidizing (H=W)	2632	2700	NA	NA	N/A	2404	2589	2620	NA	2733
Softening Reducing (H=1/2W)	2380	2660	2179	2137	2701	2169	2454	2533	2048	2690
Softening Oxidizing (H=1/2W)	2670	2700	NA	NA	N/A	2473	2621	2664	NA	2733
Fluid - Reducing	2470	2695	2223	2160	2721	2210	2546	2597	2139	2700
Fluid - Oxidizing	2698	2700	NA	NA	N/A	2503	2656	<2700	NA	2733

Temperature in Degrees F

Petroleum Cokes (50 Grams)								
Part #	Lot #	% SULFUR	% ASH	% VOL. MATTER	BTU	FIXED C	% C	% H
AR-742B (GR PET COKE)	CHAL196	0.89	0.09	9.67	NA	NA	93.81	3.76
AR-744 (CAL PET COKE)	744809	2.53	0.33	0.45	13,989	99.23	95.58	(0.23)
AR-745 (GR PET COKE)	NO LONGER AVAILABLE							
AR-747 (GR PET COKE)	471009	4.03	0.49	11.87	15,443	87.64	89.70	3.65
AR-756 (GR PET COKE)	561203	5.27	0.92	6.52	14,494	NA	89.60	1.66
		%N	% Ni	% Fe	% Va	% Ca	% Si	
AR-742B (GR PET COKE)	CHAL196	1.27	0.0068	0.0129	0.0022	0.0037	0.0081	
AR-744 (CAL PET COKE)	744809	0.92	0.0164	0.0917	0.0239	0.0079	0.0153	
AR-745 (GR PET COKE)	NO LONGER AVAILABLE							
AR-747 (GR PET COKE)	471009	1.41	0.0163	0.0185	(0.1165)	0.0251	(0.0284)	
AR-756 (GR PET COKE)	561203	1.90	0.029	0.0317	0.1675	0.0105	0.0386	

Prox Coal And Coke Standards						
Part #	Lot #	% SULFUR	% ASH	% VOL MATTER	BTU	FIXED C
AR-1720	030309	0.29	6.23	43.25	11749	50.52
AR-1721	721409	0.56	7.33	42.96	11195	49.71
AR-1722	722711	0.84	20.57	23.01	12034	56.42
AR-1723	723409	1.02	6.91	36.20	13715	56.89
AR-1724	241005	1.52	4.38	37.21	14239	58.40
AR-1726	726411	1.91	17.98	26.33	11949	55.69
AR-1727	707707	2.34	21.38	28.07	11645	50.51
AR-1728	708807	2.95	7.69	39.35	12357	52.96
AR-1729	78408	3.42	22.88	25.98	11250	51.14
AR1730	821008	5.06	12.03	38.22	12882	49.75
AR-1731	731198	5.51	45.14	20.00	7798	34.86
AR-1732	712307	6.05	19.21	29.75	12214	51.04
AR-1733 Anthracite	733410	0.55	17.58	6.08	11990	76.34
AR-1933 LIGNITE	TEXLIG896	0.61	7.56	38.38	13594	54.06
AR-732 (MET COKE)	32KO97	0.59	7.84	0.63	13168	91.53
AR-733 (MET COKE)	733311	0.60	8.04	0.85	13123	96.37
AR-734 (MET COKE)	341009	0.76	9.57	0.42	12878	90.01