



# Reference Standards for Solid Waste Analysis

## Solid Matrix Standards

Solid Matrix

AccuStandard offers a broad range of trace element standards in Solid Matrices to meet the requirements for "real world" solid waste reference materials. All Standards are furnished with a Certificate of Analysis, with the mean values, standard deviations, confidence intervals & performance intervals. A list of additional elements/analytes, instructions & other pertinent information is also included. Values listed on the Certificate are generally the result of round robin analyses consisting of testing conducted by an average of 20 independent laboratories.

- Ideal for both AA and ICP Analysis
- Certified by EPA Methods and Protocols
- NATURAL Matrix, Not spiked or fortified
- US EPA SW-846, 3rd Edition Method 3050
- Method 1311
- Lead Abatement Program Material

### Metals in Sludges

Metal Concentration (in mg/Kg)	Paint Sludge CRM006-050	Plating Sludge #1 CRM009-100	Plating Sludge #2 CRM010-100	Plating Sludge #3 (POTW) CRM011-100	Raw Sewage CRM018-050	Sewage Sludge CRM029-050
Metal	50g	120g	100g	100g	50g	50g
Al (Aluminum)	73	(890)	692	(20)	22,436	18,200
Sb (Antimony)	----	(9)	----	(10)	ND	(2.34)
As (Arsenic)	----	(20)	----	(20)	6.63	26.5
Ba (Barium)	9,970	(50)	175	(5)	1,103	806
Be (Beryllium)	----	----	----	----	0.30	4.35
B (Boron)	(53)	(150)	102	(18,000)	(25.8)	(16.6)
Cd (Cadmium)	32	(1)	----	(4)	5.57	537
Ca (Calcium)	111	(1,100)	563	(180)	49,068	37,300
Cr (Chromium)	11	50	79	59,225	40.1	325
Co (Cobalt)	----	(7)	----	(10)	3.22	3.07
Cu (Copper)	(6)	121,415	63,169	108	840	665
Fe (Iron)	64	(3,800)	2,699	(4,700)	9,903	8,640
Pb (Lead)	753	(14,230)	119,344	269	126	277
Mg (Magnesium)	47	(150)	(80)	(50)	4,302	3,900
Mn (Manganese)	(1)	(40)	17	(30)	200	165
Hg (Mercury)	----	(1)	(2)	(10)	4.78	4.17
Mo (Molybdenum)	----	(20)	(32)	----	10.5	8.77
Ni (Nickel)	(2)	343	194	41,975	20.4	150
P (Phosphorus)	----	----	----	----	----	----
K (Potassium)	8,710	(640)	----	(49,000)	2,657	2,340
Se (Selenium)	(3)	----	----	(4)	8.38	19.0
Si (Silicon)	----	----	----	----	(609)	(782)
Ag (Silver)	----	9	56	(1)	72.1	54.0
Na (Sodium)	91	(18,000)	1,576	(23,000)	1,002	1,110
Sr (Strontium)	(90)	(30)	----	(1)	420	(372)
Tl (Thallium)	(40)	(30)	----	(20)	ND	----
Sn (Tin)	(100)	(38,000)	----	(120)	----	----
Ti (Titanium)	(2)	(70)	----	(2)	----	----
V (Vanadium)	----	(1)	----	(20)	39.2	30.9
Zn (Zinc)	737,431	(40)	183	----	1,121	847

All values expressed in mg/Kg, parts per million (ppm) unless otherwise noted.

### TCLP Metals - Method 1311

Metal Conc. in mg/L	Soil from Superfund Site CRM202-225	Soil from Superfund Site CRM204-225	Ash from Incinerator CRM205-225	Soil from Superfund Site CRM206-225	Soil from Superfund Site CRM207-225	TCLP Metals in Soil CRM208-225
Metal	225 g	225 g	225 g	225 g	225 g	225 g
As (Arsenic)	1.44	0.82	89.5	13.9	9.51	3.93
Ba (Barium)	5.85	(0.04)	0.44	0.38	0.40	32.8
Cd (Cadmium)	19.6	14.4	144	8.3	7.45	46.7
Cr (Chromium)	11.1	4.46	12.7	0.13	1.36	0.87
Pb (Lead)	48.5	10.7	155	2.16	2.76	2.14
Hg (Mercury)	5.58	(< 0.0025)	ND	0.65	0.02	0.62
Se (Selenium)	1.38	Trace	ND	20.5	20.8	ND
Ag (Silver)	5.01	(< 0.1)	ND	1.04	0.99	ND

**NOTES:**

1. These values are as extracted into Fluid #1.
2. All values expressed in mg/L, parts per million (ppm) unless otherwise noted.
3. Values in parenthesis are not certified and are given for information only.
4. ND is not detected.

# Reference Standards for Solid Waste Analysis

## Solid Matrix Standards



Solid Matrix

### Metals in Soil

Metals Conc. (in mg/Kg) Metal	Sewage Sludge Amended Soil CRM005-050 50g	Soil/ Sediment #4 CRM008-050 50g	Dry Soil #2 Certified pH 2.96 CRM020-050 ** 50g	Dry Soil #3 CRM021-100 100g	Dry soil #5 plus Cyanide CRM022-030 30g	Metals in Soil CRM028-050 50g
Al (Aluminum)	15,333	23,906	2,755	2,725	10,060	7,562
Sb (Antimony)	----	(3)	8.38	4,955	(<0.2)	----
As (Arsenic)	7	14	400	25	5	3.83
Ba (Barium)	853	54	24.8	586	109	73.2
Be (Beryllium)	1	1	----	----	0.5	0.38
B (Boron)	----	(27)	----	----	(16)	ND
Cd (Cadmium)	14	(1)	15.4	1	3	0.50
Ca (Calcium)	119,477	2,935	25,584	5,426	27,242	5,883
Cr (Chromium)	41	48	13.6	11	19	19.0
Co (Cobalt)	6	11	4.51	(3)	6	4.30
Cu (Copper)	465	36	729	4,792	12	8.51
Fe (Iron)	12,650	33,042	191,706	6,481	13,555	10,000
Pb (Lead)	89	95	5,111	(144,742)	415	10.4
Mg (Magnesium)	6,706	6,742	2,687	(2,367)	9,524	2,995
Mn (Manganese)	172	261	945	174	318	209
Hg (Mercury)	3	1	1.12	5	(0.02)	----
Mo (Molybdenum)	14	(2)	----	----	(<1)	----
Ni (Nickel)	26	26	16.9	13	16	13.4
P (Phosphorus)	(10,071)	----	----	----	----	----
K (Potassium)	6,229	3,948	(857)	1,006	3,170	2,045
Se (Selenium)	20	(1)	6.57	----	(0.3)	ND
Si (Silicon)	----	(471)	----	----	(80)	----
Ag (Silver)	36	(1)	38.5	7	(<0.5)	----
Na (Sodium)	2,488	8,706	(79.2)	380	268	3.31
Sr (Strontium)	----	42	(24.7)	----	(54)	ND
Tl (Thallium)	(2)	(<1)	5.91	(<1)	(<0.2)	----
Sn (Tin)	----	----	----	(304)	----	----
Ti (Titanium)	----	----	----	----	----	----
V (Vanadium)	109	44	6.47	(8.7)	23	19.2
Zn (Zinc)	625	134	3,011	546	46	75.0
pH	----	----	2.96	----	----	----
CN	----	----	----	----	26.6	----

  

Continued (in mg/Kg) Metal	Sediment, + CN CRM015-050 50g	Sediment CRM016-050 50g	Soil CRM023-050 50g	Soil CRM025-050 50g	Soil CRM026-030 30g	Soil CRM027-050 50g	Soil CRM024-050 50g
Al (Aluminum)	9,200	8,920	8,472	7,637	17,730	9,149	8,681
Sb (Antimony)	(ND)	(ND)	----	(<3.2)	(<3.2)	----	(1.17)
As (Arsenic)	6.6	6.48	380	339	5.64	12.5	3.42
Ba (Barium)	83.0	79.3	75.5	1,839	214	167	79.6
Be (Beryllium)	0.47	0.49	0.4	0.33	18.0	----	0.43
B (Boron)	(8.6)	(13.0)	(11.2)	(17.2)	(25.4)	2.74	7.22
Cd (Cadmium)	(ND)	0.47	0.9	369	11.7	11.9	2.15
Ca (Calcium)	23,463	22,646	5,425	28,320	6,221	5,963	5,534
Cr (Chromium)	14.3	14.5	31.1	441	27.2	27.0	25.4
Co (Cobalt)	6.04	5.96	8.9	4.07	6.77	4.77	----
Cu (Copper)	16.1	15.5	4.7	7.76	18.8	9.79	8.70
Fe (Iron)	17,070	16,831	10,678	9,439	21,906	11,299	10,196
Pb (Lead)	15.04	14.1	213	1,447	25.6	51.7	15.7
Mg (Magnesium)	13,611	13,246	3,064	4,376	2,837	2,786	2,945
Mn (Manganese)	183.4	180.0	206	173	633	258	199
Hg (Mercury)	0.10	0.11	77.8	99.8	2.42	3.85	0.71
Mo (Molybdenum)	1.16	(0.97)	----	----	----	----	0.58
Ni (Nickel)	17.5	16.7	11.0	12.2	14.4	10.7	15.0
P (Phosphorus)	----	----	----	----	----	----	----
K (Potassium)	2,074	1,958	2,231	1,992	3,600	2,115	2,102
Se (Selenium)	(1.0)	(1.0)	116	518	(1.86)	13.8	(0.54)
Si (Silicon)	(491)	(347)	(352)	(171)	(166)	387	(404)
Ag (Silver)	(ND)	(0.7)	132	(0.57)	5.90	----	13.3
Na (Sodium)	400	292.0	295	313	199	241	287
Sr (Strontium)	(62)	(61)	(32)	(408)	38.4	42.7	35.4
Tl (Thallium)	(ND)	(4.6)	111	(<4.8)	(<4.8)	----	(13.6)
Sn (Tin)	----	----	----	----	----	----	----
Ti (Titanium)	----	----	----	----	----	----	----
V (Vanadium)	22.1	22.5	21.7	19.3	32.0	21.8	20.8
Zn (Zinc)	69.9	69.7	93.8	51.8	140	51.5	37.3
pH	----	----	----	----	----	----	----
CN	6.04	----	----	----	----	----	----

Solid Matrix Standards continued on next page



# Reference Standards for Solid Waste Analysis

## Solid Matrix Standards

### Metals in Ashes

Metals Conc. (in mg/Kg) Metal	Ash #1 CRM001-100 100 g	Ash #2 CRM012-100 100 g	Ash #3 CRM019-050 100 g	Ash #4 CRM205-225 100 g
Al (Aluminum)	----	2,160	(2, 759)	----
Sb (Antimony)	----	----	(223)	----
As (Arsenic)	----	----	78	90
Ba (Barium)	428	19	342	0.4
Be (Beryllium)	----	----	(2)	----
B (Boron)	----	----	(336)	----
Cd (Cadmium)	----	362	432	147
Ca (Calcium)	----	2,111	(51,949)	----
Cr (Chromium)	30	161,520	55	13
Co (Cobalt)	----	(22)	(26)	----
Cu (Copper)	40	3,015	279	----
Fe (Iron)	(16,300)	28,664	(12,693)	----
Pb (Lead)	----	120	4,414	155
Mg (Magnesium)	----	1,506	6,307	----
Mn (Manganese)	(300)	202	(480)	----
Hg (Mercury)	----	----	(2)	ND
Mo (Molybdenum)	----	----	(26)	----
Ni (Nickel)	20	13,279	22	----
P (Phosphorus)	----	----	----	----
K (Potassium)	----	73,324	(49,344)	----
Se (Selenium)	----	----	2	ND
Ag (Silver)	----	55	6	ND
Na (Sodium)	----	29,200	(50,522)	----
Sr (Strontium)	(1,016)	(10)	(173)	----
Tl (Thallium)	----	----	(42)	----
Sn (Tin)	----	(2,055)	(410)	----
Ti (Titanium)	(465)	(20)	(2,870)	----
V (Vanadium)	----	(52)	29	----
Zn (Zinc)	----	635	22,217	----

#### NOTES:

1. All values expressed in mg/Kg, parts per million (ppm) unless otherwise noted
2. Values in parenthesis are not certified and are given for information only.
3. ND is not detected.

\*\* Values certified by analysis from 260 independent laboratories

### Lead Reference Materials

- Natural matrix, not spiked or fortified
- Samples tested & suitable for lead abatement program

#### Paint Sludge

CRM006-050	50 g
Certified lead value	753 mg/kg

#### Paint Waste

CRM013-050	50 g
Certified lead value	643 mg/kg

#### Dust

CRM014-050	50 g
Certified lead value	1,914 mg/kg

### Metals in Particulates & Water Treatment Media

Metals Conc. in mg/Kg (in mg/Kg) Metal	Activated Charcoal Filter CRM002-100 100 g	Diatomaceous Earth Filter CRM004-100 100 g	Paint Chips CRM013-050 50 g	Baghouse Dust CRM014-050 50 g
Al (Aluminum)	(1,800)	(29,000)	(1,200)	(6,000)
Sb (Antimony)	(2)	(5)	(20)	(20)
As (Arsenic)	(30)	----	(1)	(2)
Ba (Barium)	(80)	1,595	(1,200)	(1,930)
Be (Beryllium)	----	----	----	----
B (Boron)	(80)	(1,160)	12	(50)
Cd (Cadmium)	(1)	2	38	510
Ca (Calcium)	(980)	(28,000)	(1,500)	(3,900)
Cr (Chromium)	36,339	21	618	2,228
Co (Cobalt)	(10)	(140)	(10)	(10)
Cu (Copper)	96,935	(20)	(30)	(110)
Fe (Iron)	(1,150)	----	(1,400)	(5,860)
Pb (Lead)	(5)	11,871	643	1,914
Mg (Magnesium)	(190)	(17,000)	(430)	(1,100)
Mn (Manganese)	(8)	(90)	(120)	(110)
Hg (Mercury)	(5)	(3)	----	(2)
Mo (Molybdenum)	----	(4)	(1)	(30)
Ni (Nickel)	(30)	(140)	(10)	(10)
P (Phosphorus)	----	----	----	----
K (Potassium)	(490)	----	(170)	(340)
Se (Selenium)	(4)	(2,000)	----	(1)
Ag (Silver)	18	(1)	----	(10)
Na (Sodium)	(480)	(4,200)	(310)	(780)
Sr (Strontium)	(110)	(80)	(950)	(1,900)
Tl (Thallium)	(20)	(30)	(4)	(10)
Sn (Tin)	(120)	(580)	(80)	(140)
Ti (Titanium)	(210)	(100)	(70)	(130)
V (Vanadium)	(40)	(28)	(1)	(2)
Zn (Zinc)	----	(8,500)	(2,370)	(3,150)

#### NOTES:

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CRM001-100:66  
CRM002-100:66  
CRM004-100:66  
CRM005-050:65  
CRM006-050:64, 66  
CRM008-050:65  
CRM009-100:64  
CRM010-100:64  
CRM011-100:64  
CRM012-100:66  
CRM013-050:66  
CRM014-050:66  
CRM015-050:65  
CRM016-050:65  
CRM018-050:64  
CRM019-050:66  
CRM020-050:65  
CRM021-100:65  
CRM022-030:65  
CRM023-050:65  
CRM024-050:65  
CRM025-050:65  
CRM026-030:65  
CRM027-050:65  
CRM028-050:65  
CRM029-050:64  
CRM202-225:64  
CRM204-225:64  
CRM205-225:64, 66  
CRM206-225:64  
CRM207-225:64  
CRM208-225:64