

Ash, particulate and dust

Ash and particulate

Code	Product	Unit																																							
LGC6180	<p>Pulverised fuel ash - Extractable and total metals</p> <p>Collected from a disposal site near Camarthan Bay in South Wales, UK. Pulverised fuel ash is a waste product of coal-fired power stations. The extractable metal content refers to metals soluble in Aqua Regia using methods based on ISO 11466 (1995).</p> <p><u>Extractable metal content</u></p> <p>Assessed values</p> <table> <tr> <td>Al.....</td> <td>25700 mg/kg</td> <td>Cr.....</td> <td>43.8 mg/kg</td> <td>Na</td> <td>1230 mg/kg</td> </tr> <tr> <td>As.....</td> <td>91.7 mg/kg</td> <td>Cu.....</td> <td>67.9 mg/kg</td> <td>Ni</td> <td>48.4 mg/kg</td> </tr> <tr> <td>Ba</td> <td>676 mg/kg</td> <td>K.....</td> <td>6170 mg/kg</td> <td>Pb</td> <td>48.6 mg/kg</td> </tr> <tr> <td>Ca</td> <td>6415 mg/kg</td> <td>Mg</td> <td>3660 mg/kg</td> <td>V</td> <td>105 mg/kg</td> </tr> <tr> <td>Co</td> <td>18.5 mg/kg</td> <td>Mn</td> <td>259 mg/kg</td> <td>Zn.....</td> <td>115 mg/kg</td> </tr> </table> <p>Indicative values for B, Be, Fe, Hg, Li, Sb, Se, Ti</p> <p><u>Total metal content</u></p> <p>Indicative values for Al, As, Ba, Be, Ca, Co, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, Pb, Sb, Se, Sn, Ti, V, Zn</p>	Al.....	25700 mg/kg	Cr.....	43.8 mg/kg	Na	1230 mg/kg	As.....	91.7 mg/kg	Cu.....	67.9 mg/kg	Ni	48.4 mg/kg	Ba	676 mg/kg	K.....	6170 mg/kg	Pb	48.6 mg/kg	Ca	6415 mg/kg	Mg	3660 mg/kg	V	105 mg/kg	Co	18.5 mg/kg	Mn	259 mg/kg	Zn.....	115 mg/kg	50 g									
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BCR-038	<p>Fly ash from pulverised coal - Trace elements</p> <p>Certified values</p> <table> <tr> <td>As.....</td> <td>48.0 mg/kg</td> <td>Cu.....</td> <td>176 mg/kg</td> <td>Na</td> <td>3740 mg/kg</td> </tr> <tr> <td>Cd</td> <td>4.6 mg/kg</td> <td>F</td> <td>538 mg/kg</td> <td>Pb</td> <td>262 mg/kg</td> </tr> <tr> <td>Cl</td> <td>323 mg/kg</td> <td>Fe.....</td> <td>33800 mg/kg</td> <td>Zn.....</td> <td>581 mg/kg</td> </tr> <tr> <td>Co</td> <td>53.8 mg/kg</td> <td>Hg.....</td> <td>2.10 mg/kg</td> <td></td> <td></td> </tr> <tr> <td>Cr</td> <td>192 mg/kg</td> <td>Mn</td> <td>479 mg/kg</td> <td></td> <td></td> </tr> </table> <p>Indicative values for Ni, Th, V</p>	As.....	48.0 mg/kg	Cu.....	176 mg/kg	Na	3740 mg/kg	Cd	4.6 mg/kg	F	538 mg/kg	Pb	262 mg/kg	Cl	323 mg/kg	Fe.....	33800 mg/kg	Zn.....	581 mg/kg	Co	53.8 mg/kg	Hg.....	2.10 mg/kg			Cr	192 mg/kg	Mn	479 mg/kg			5 g									
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BCR-176R	<p>Fly ash - Trace elements</p> <p>The CRM was prepared from a fly ash collected in the electrostatic filters of a city waste incineration plant.</p> <table> <thead> <tr> <th>Compound</th> <th>Certified value (mg/kg)</th> <th>Uncertainty (mg/kg)</th> </tr> </thead> <tbody> <tr><td>As.....</td><td>54.....</td><td>5</td></tr> <tr><td>Cd</td><td>226.....</td><td>19</td></tr> <tr><td>Co</td><td>26.7.....</td><td>1.6</td></tr> <tr><td>Cr</td><td>810.....</td><td>70</td></tr> <tr><td>Cu</td><td>1050.....</td><td>70</td></tr> <tr><td>Fe.....</td><td>13100.....</td><td>500</td></tr> <tr><td>Ni</td><td>117.....</td><td>6</td></tr> <tr><td>Pb</td><td>5000.....</td><td>500</td></tr> <tr><td>Sb</td><td>850.....</td><td>50</td></tr> <tr><td>Se</td><td>18.3.....</td><td>1.9</td></tr> <tr><td>Tl</td><td>1.32.....</td><td>0.21</td></tr> <tr><td>Zn.....</td><td>16800.....</td><td>400</td></tr> </tbody> </table>	Compound	Certified value (mg/kg)	Uncertainty (mg/kg)	As.....	54.....	5	Cd	226.....	19	Co	26.7.....	1.6	Cr	810.....	70	Cu	1050.....	70	Fe.....	13100.....	500	Ni	117.....	6	Pb	5000.....	500	Sb	850.....	50	Se	18.3.....	1.9	Tl	1.32.....	0.21	Zn.....	16800.....	400	40 g
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BCR-490	<p>Fly ash - Dioxins and furans</p> <table> <thead> <tr> <th>Compound</th> <th>Certified value µg/kg</th> <th>Uncertainty µg/kg</th> </tr> </thead> <tbody> <tr><td>2,3,7,8-TCDD.....</td><td>0.169.....</td><td>0.012</td></tr> <tr><td>1,2,3,7,8-PeCDD</td><td>0.67.....</td><td>0.04</td></tr> <tr><td>1,2,3,4,7,8-HxCDD</td><td>0.95.....</td><td>0.11</td></tr> <tr><td>1,2,3,6,7,8-HxCDD</td><td>4.8.....</td><td>0.4</td></tr> <tr><td>1,2,3,7,8,9-HxCDD</td><td>2.84.....</td><td>0.17</td></tr> <tr><td>2,3,7,8-TCDF</td><td>0.90.....</td><td>0.05</td></tr> <tr><td>1,2,3,7,8-PeCDF.....</td><td>1.71.....</td><td>0.12</td></tr> <tr><td>2,3,4,7,8-PeCDF.....</td><td>1.8.....</td><td>0.11</td></tr> <tr><td>1,2,3,4,7,8-HxCDF.....</td><td>2.37.....</td><td>0.12</td></tr> <tr><td>1,2,3,6,7,8-HxCDF.....</td><td>2.64.....</td><td>0.14</td></tr> <tr><td>1,2,3,7,8,9-HxCDF.....</td><td>0.34.....</td><td>0.05</td></tr> <tr><td>2,3,4,6,7,8-HxCDF.....</td><td>2.47.....</td><td>0.17</td></tr> </tbody> </table>	Compound	Certified value µg/kg	Uncertainty µg/kg	2,3,7,8-TCDD.....	0.169.....	0.012	1,2,3,7,8-PeCDD	0.67.....	0.04	1,2,3,4,7,8-HxCDD	0.95.....	0.11	1,2,3,6,7,8-HxCDD	4.8.....	0.4	1,2,3,7,8,9-HxCDD	2.84.....	0.17	2,3,7,8-TCDF	0.90.....	0.05	1,2,3,7,8-PeCDF.....	1.71.....	0.12	2,3,4,7,8-PeCDF.....	1.8.....	0.11	1,2,3,4,7,8-HxCDF.....	2.37.....	0.12	1,2,3,6,7,8-HxCDF.....	2.64.....	0.14	1,2,3,7,8,9-HxCDF.....	0.34.....	0.05	2,3,4,6,7,8-HxCDF.....	2.47.....	0.17	30 g
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BCR-615	<p>Fly ash - Dioxins and furans</p> <p>Certified values</p> <table> <tr> <td>2,3,7,8-T₄CDD (D48)</td> <td>27 pg/g</td> <td>2,3,4,7,8-P₅CDF (F114)</td> <td>125 pg/g</td> </tr> <tr> <td>1,2,3,7,8-P₅CDD (D54)</td> <td>92 pg/g</td> <td>1,2,3,4,7,8-H₆CDF (F118)</td> <td>203 pg/g</td> </tr> <tr> <td>1,2,3,4,7,8-H₆CDD (D66).....</td> <td>74 pg/g</td> <td>1,2,3,6,7,8-H₆CDF (F121)</td> <td>204 pg/g</td> </tr> <tr> <td>1,2,3,6,7,8-H₆CDD (D67).....</td> <td>103 pg/g</td> <td>1,2,3,7,8,9-H₆CDF (F124)</td> <td>13.3 pg/g</td> </tr> <tr> <td>1,2,3,7,8,9-H₆CDD (D70).....</td> <td>108 pg/g</td> <td>2,3,4,6,7,8-H₆CDF (F130).....</td> <td>130 pg/g</td> </tr> <tr> <td>1,2,3,4,6,7,8-H₇CDD (D73).....</td> <td>0.87 x 10³ pg/g</td> <td>1,2,3,4,6,7,8-H₇CDF (F131).....</td> <td>0.75 x 10³ pg/g</td> </tr> <tr> <td>O₈CDD (D75).....</td> <td>1.75 x 10³ pg/g</td> <td>1,2,3,4,7,8,9-H₇CDF (F134).....</td> <td>61 pg/g</td> </tr> <tr> <td>2,3,7,8-T₄CDF (F83).....</td> <td>86 pg/g</td> <td>O₈CDF (F135).....</td> <td>0.29 x 10³ pg/g</td> </tr> <tr> <td>1,2,3,7,8-P₅CDF (F94).....</td> <td>176 pg/g</td> <td></td> <td></td> </tr> </table>	2,3,7,8-T ₄ CDD (D48)	27 pg/g	2,3,4,7,8-P ₅ CDF (F114)	125 pg/g	1,2,3,7,8-P ₅ CDD (D54)	92 pg/g	1,2,3,4,7,8-H ₆ CDF (F118)	203 pg/g	1,2,3,4,7,8-H ₆ CDD (D66).....	74 pg/g	1,2,3,6,7,8-H ₆ CDF (F121)	204 pg/g	1,2,3,6,7,8-H ₆ CDD (D67).....	103 pg/g	1,2,3,7,8,9-H ₆ CDF (F124)	13.3 pg/g	1,2,3,7,8,9-H ₆ CDD (D70).....	108 pg/g	2,3,4,6,7,8-H ₆ CDF (F130).....	130 pg/g	1,2,3,4,6,7,8-H ₇ CDD (D73).....	0.87 x 10 ³ pg/g	1,2,3,4,6,7,8-H ₇ CDF (F131).....	0.75 x 10 ³ pg/g	O ₈ CDD (D75).....	1.75 x 10 ³ pg/g	1,2,3,4,7,8,9-H ₇ CDF (F134).....	61 pg/g	2,3,7,8-T ₄ CDF (F83).....	86 pg/g	O ₈ CDF (F135).....	0.29 x 10 ³ pg/g	1,2,3,7,8-P ₅ CDF (F94).....	176 pg/g			50 g			
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Code	Product	Unit
New NIES24	Fly ash - PCDDs and PCDFs	15 g
	Certified values (dry weight basis)	
	PCDD isomers	
	2,3,7,8-TeCDD 4.2 ± 0.6 ng/g	1,2,3,7,8,9-HxCDD 49 ± 8 ng/g
	1,2,3,7,8-PeCDD 28 ± 4 ng/g	1,2,3,4,6,7,8-HpCDD 250 ± 60 ng/g
	1,2,3,4,7,8-HxCDD 39 ± 7 ng/g	OCDD 280 ± 70 ng/g
	1,2,3,6,7,8-HxCDD 38 ± 7 ng/g	
	PCDF isomers	
	2,3,7,8-TeCDF 7.1 ± 1.7 ng/g	1,2,3,7,8,9-HxCDF 2.9 ± 1.2 ng/g
	1,2,3,7,8-PeCDF 23 ± 8 ng/g	2,3,4,6,7,8-HxCDF 38 ± 9 ng/g
	2,3,4,7,8-PeCDF 23 ± 5 ng/g	1,2,3,4,6,7,8-HpCDF 160 ± 50 ng/g
	1,2,3,4,7,8-HxCDF 43 ± 8 ng/g	1,2,3,4,7,8,9-HpCDF 18 ± 7 ng/g
	1,2,3,6,7,8-HxCDF 45 ± 8 ng/g	OCDF 63 ± 21 ng/g
	PCDD congeners	
	TeCDDs 55 ± 8 ng/g	HpCDDs 420 ± 80 ng/g
	PeCDDs 170 ± 20 ng/g	OCDD 280 ± 70 ng/g
	HxCDDs 390 ± 60 ng/g	Total PCDDs 1300 ± 200 ng/g
	PCDF congener	
	TeCDFs 220 ± 30 ng/g	HpCDFs 260 ± 80 ng/g
	PeCDFs 330 ± 50 ng/g	OCDF 63 ± 21 ng/g
	HxCDFs 400 ± 50 ng/g	Total PCDFs 1300 ± 200 ng/g
	Total (PCDDs + PCDFs) 2600 ± 400 ng/g	
	TEQ values are also listed in the certificate	
	Indicative values for PCBs	

Code	Product	Unit
New CIL-EDF-5369	Fly ash	10 g
	Analyte (all values in ng/kg)	Assigned Value ¹ Standard Deviation Reference Value ² (n) ³
	Polychlorinated dioxins and furans	
	1,3,6,8-TetraCDD 18.9 3.90 18.9 ± 7.8 20	
	2,3,7,8-TetraCDD 11.4 2.98 11.4 ± 5.96 37	
	Total TetraCDD 147 25.9 147 ± 51.8 30	
	1,2,3,7,8-PentaCDD 38.4 9.72 38.4 ± 19.4 37	
	Total PentaCDD 327 58.1 327 ± 116 30	
	1,2,3,4,7,8-HexaCDD 31.3 10.9 31.3 ± 21.8 37	
	1,2,3,6,7,8-HexaCDD 70.4 22.2 70.4 ± 44.4 37	
	1,2,3,7,8,9-HexaCDD 56.3 19.2 56.3 ± 38.4 37	
	Total HexaCDD 780 132 780 ± 264 30	
	1,2,3,4,6,7,8-HeptaCDD 899 301 899 ± 602 37	
	Total HeptaCDD 1810 440 1810 ± 880 30	
	OctaCDD 3660 1150 3660 ± 2300 38	
	1,3,6,8-TetraCDF 29.2 8.27 29.2 ± 16.5 9	
	2,3,7,8-TetraCDF 21.8 5.87 21.8 ± 11.7 37	
	Total TetraCDF 621 104 621 ± 208 30	
	1,2,3,7,8-PentaCDF 59.6 14.4 59.6 ± 28.8 37	
	2,3,4,7,8-PentaCDF 46.9 12.0 46.9 ± 24.0 37	
	Total-PentaCDF 780 131 780 ± 262 30	
	1,2,3,4,7,8-HexaCDF 89.7 28.8 89.7 ± 57.6 37	
	1,2,3,6,7,8-HexaCDF 100 30.4 100 ± 60.8 37	
	1,2,3,7,8,9-HexaCDF 13.3 2.54 13.3 ± 5.08 35	
	2,3,4,6,7,8-HexaCDF 125 34.7 125 ± 69.4 37	
	Total-HexaCDF 1000 154 1000 ± 308 30	
	1,2,3,4,6,7,8-HeptaCDF 530 159 530 ± 318 37	
	1,2,3,4,7,8,9-HeptaCDF 117 37.5 117 ± 75.0 37	
	Total-HeptaCDF 1080 228 1080 ± 456 30	
	OctaCDF 864 243 864 ± 486 37	
	Polychlorinated biphenyls⁴	
	3,3',4,4'-TetraCB (#77) 8.26 1.85 8.26 ± 3.70 23	
	3,4,4',5-TetraCB (#81) 5.26 0.93 5.26 ± 1.86 23	
	2,3,3',4,4'-PentaCB (#105) 7.61 3.29 7.61 ± 6.58 24	
	2,3,4,4',5-PentaCB (#114) 2.75 0.65 2.75 ± 1.30 24	
	2,3',4,4',5-PentaCB (#118) 8.26 4.48 8.26 ± 8.96 25	
	2',3,4,4',5-PentaCB (#123) 1.72 0.45 1.72 ± 0.90 23	
	3,3',4,4',5-PentaCB (#126) 13.9 2.52 13.9 ± 5.04 24	
	2,3,3',4,4',5-HexaCB (#156) 9.43 1.65 9.43 ± 3.30 24	
	2,3,3',4,4',5'-HexaCB (#157) 6.24 0.84 6.24 ± 1.68 24	
	2,3',4,4',5,5'-HexaCB (#167) 4.26 0.69 4.26 ± 1.38 24	
	3,3',4,4',5,5'-HexaCB (#169) 9.93 1.45 9.93 ± 2.90 24	
	2,2',3,3',4,4',5-HeptaCB (#170) 20.2 7.90 20.2 ± 15.8 6	
	2,2',3,4,4',5,5'-HeptaCB (#180) 11.4 5.07 11.4 ± 10.1 6	
	2,3,3',4,4',5,5'-HeptaCB (#189) 14.3 2.22 14.3 ± 4.44 24	

¹ Assigned value as determined by Manna Associates in the UK using Cofino analysis of raw interlaboratory study data.

² Reference value is the Assigned Value plus or minus two standard deviations. Negative numbers resulting from two standard deviations being greater than the assigned value have no significance.

³ Number of laboratories providing results for this analyte.

⁴ All numbers in parentheses refer to the IUPAC designation for the compound.

Ash, particulate and dust

Code	Product	Unit
NIST-2689	Coal fly ash - Constituent elements Set of 3 x 10 g Certified values Al.....12.94 % K.....2.20 % P.....0.10 % Ca.....2.18 % Mg.....0.61 % Si.....24.06 % Fe(total).....9.32 % Na.....0.25 % Ti.....0.75 % Indicative values for As, Ba, Be, Cd, Co, Cr, Cs, Eu, Hf, Hg, Mn, Ni, Pb, Sb, Sc, Se, Sr, Th, Zn	set (3)
NIST-2690	Coal fly ash - Constituent elements Set of 3 x 10 g Certified values Al.....12.35 % Mg.....1.53 % Si.....25.85 % Ca.....5.71 % Na.....0.24 % Ti.....0.52 % Fe(total).....3.57 % P.....0.52 % K.....1.04 % S.....0.15 % Indicative values for As, Ba, Be, Cd, Co, Cr, Cs, Eu, Hf, Hg, Mn, Ni, Pb, Sb, Sc, Se, Sr, Th, Zn	set (3)
NIST-2691	Coal fly ash - Constituent elements Set of 3 x 10 g Certified values Al.....9.81 % Mg.....3.12 % Si.....16.83 % Ca.....18.45 % Na.....1.09 % Ti.....0.90 % Fe(total).....4.42 % P.....0.51 % K.....0.34 % S.....0.83 % Indicative values for As, Ba, Be, Cd, Co, Cr, Cs, Eu, Hf, Hg, Mn, Ni, Pb, Sb, Sc, Se, Sr, Th, Zn	set (3)
IC-CTA-FFA-1	Fine fly ash - Constituent elements Collected from the 3 rd zone electrofilters at Kozenice power station in Poland Certified values for elements Al.....14.87 wt. % Hf.....6.09 mg/kg Si.....22.48 wt. % As.....53.6 mg/kg La.....60.7 mg/kg Sm.....10.9 mg/kg Ba.....835 mg/kg Li.....128 mg/kg Sc.....24.2 mg/kg Ce.....120 mg/kg Lu.....0.658 mg/kg Sr.....250 mg/kg Cr.....156 mg/kg Mn.....1066 mg/kg Ta.....2.11 mg/kg Cu.....158 mg/kg Na.....2.19 mg/kg Tb.....1.38 mg/kg Dy.....9.09 mg/kg Nd.....56.8 mg/kg Th.....29.4 mg/kg Er.....4.52 mg/kg Ni.....99.0 mg/kg Tm.....0.705 mg/kg Eu.....2.39 mg/kg P.....725 mg/kg W.....10.5 mg/kg F.....198 mg/kg Pb.....369 mg/kg Y.....45.0 mg/kg Fe.....4.89 wt. % Rb.....185 mg/kg Yb.....4.24 mg/kg Gd.....10.0 mg/kg Sb.....17.6 mg/kg Zn.....569 mg/kg Informational values for Be, Ca, Cd, Ga, In, K, Mg, Mo, Se	50 g
NCS FC82012	Coal ash - Constituents Certified values SiO ₂46.77 % MgO.....1.73 % Na ₂ O.....1.36 % Al ₂ O ₃14.96 % SO ₃3.94 % P ₂ O ₅0.50 % Fe ₂ O ₃5.51 % TiO ₂0.63 % CaO.....21.37 % K ₂ O.....1.41 %	30 g
NCS FC82014	Coal ash - Constituents Certified values SiO ₂59.98 % MgO.....1.08 % Na ₂ O.....0.22 % Al ₂ O ₃31.70 % SO ₃0.28 % P ₂ O ₅0.28 % Fe ₂ O ₃7.80 % TiO ₂1.17 % CaO.....1.44 % K ₂ O.....1.36 %	30 g
NCS FC82015	Coal ash - Constituents Certified values SiO ₂62.93 % MgO.....0.90 % Na ₂ O.....1.18 % Al ₂ O ₃17.88 % SO ₃1.20 % P ₂ O ₅0.85 % Fe ₂ O ₃6.04 % TiO ₂0.79 % CaO.....6.11 % K ₂ O.....0.87 %	30 g
New NIM-GBW11131	Coal ash - Constituents Certified values SiO ₂50.08 % MgO.....0.76 % Na ₂ O.....0.41 % Al ₂ O ₃33.78 % SO ₃1.25 % P ₂ O ₅0.18 % Fe ₂ O ₃4.36 % TiO ₂1.77 % CaO.....5.50 % K ₂ O.....0.87 %	30 g
NCS FC82017	Coal ash - Constituents Certified values SiO ₂31.24 % MgO.....1.17 % Na ₂ O.....0.46 % Al ₂ O ₃10.00 % SO ₃2.76 % P ₂ O ₅0.04 % Fe ₂ O ₃8.16 % TiO ₂0.56 % CaO.....42.40 % K ₂ O.....1.28 %	30 g

Code	Product	Unit																																																																								
New NIM-GBW08401	Coal fly ash - Metals Certified values As..... 11.4 µg/g Cr 60 µg/g Pb 33.8 µg/g Be 10.7 µg/g Cu 53 µg/g Se 1.13 µg/g Cd 0.16 µg/g Fe 7.65 % V 95 µg/g Co 33.2 µg/g Mn 1178 µg/g Zn 61 µg/g Indicative values for Ba, Hg	30 g																																																																								
RTC-CRM001-100	Fly ash - Trace elements Sample from a power plant in the Western United States. The certified values were determined by USEPA SW846 (3 rd edition) Methods 3050 and 6010. This sample is suitable for use by these and other similar methods. Certified values Ba 428 mg/kg Cu 40.7 mg/kg Cr 29.1 mg/kg Ni 19.8 mg/kg	100 g																																																																								
RTC-CRM012-100	Industrial incineration ash - Metals Ash material from an industrial incineration facility located in the Western United States. The certified values were determined by USEPA SW846 (3 rd edition) Methods 3050 and 6010. The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods. Certified values Lot AR12 Ag 54,8 mg/kg Cr 162000 mg/kg Mn 202 mg/kg Al 2160 mg/kg Cu 3020 mg/kg Na 29200 mg/kg Ba 18,7 mg/kg Fe 28700 mg/kg Ni 13300 mg/kg Cd 362 mg/kg K 73300 mg/kg Pb 120 mg/kg Ca 2110 mg/kg Mg 1510 mg/kg Zn 635 mg/kg Indicative values for Co, V	100 g																																																																								
NIST-1975	Diesel particulate extract - PAHs Certified Concentrations for Selected PAHs <table border="0"> <thead> <tr> <th></th> <th>Mass Fraction mg/kg</th> <th></th> <th>Mass Fraction mg/kg</th> </tr> </thead> <tbody> <tr> <td>Phenanthrene</td> <td>8.00 ± 0.20</td> <td>Triphenylene</td> <td>2.38 ± 0.10</td> </tr> <tr> <td>Fluoranthene.....</td> <td>13.5 ± 0.6</td> <td>Benzo(b)fluoranthene</td> <td>3.20 ± 0.10</td> </tr> <tr> <td>Benzo(a)anthracene</td> <td>0.092 ± 0.015</td> <td>Benzo(k)fluoranthene.....</td> <td>0.174 ± 0.050</td> </tr> <tr> <td>Chrysene</td> <td>1.95 ± 0.07</td> <td>Benzo(e)pyrene.....</td> <td>0.268 ± 0.023</td> </tr> </tbody> </table> Reference Concentrations for PAHs, Nitro-substituted PAHs, Extract Residue Mass, Mutagenicity (revertants/ µg of organic extract).		Mass Fraction mg/kg		Mass Fraction mg/kg	Phenanthrene	8.00 ± 0.20	Triphenylene	2.38 ± 0.10	Fluoranthene.....	13.5 ± 0.6	Benzo(b)fluoranthene	3.20 ± 0.10	Benzo(a)anthracene	0.092 ± 0.015	Benzo(k)fluoranthene.....	0.174 ± 0.050	Chrysene	1.95 ± 0.07	Benzo(e)pyrene.....	0.268 ± 0.023	4 x 1.2 mL																																																				
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Ash, particulate and dust

Code	Product	Unit
NIES08	Vehicle exhaust particulates - Major and minor constituents and trace elements The NIES CRM " Vehicle Exhaust Particulates" was prepared from particulate matter collected from electrostatic precipitators in huge ventilators connected to a highway tunnel. Certified values Al.....0,33 ± 0,02 % As2,6 ± 0,2 µg/g Pb 219 ± 9 µg/g Ca0,53 ± 0,02 % Cd1,1 ± 0,1 µg/g Sb 6,0 ± 0,4 µg/g K 0,115 ± 0,008 % Co3,3 ± 0,3 µg/g Sr 89 ± 3 µg/g Mg0,101 ± 0,005 % Cr25,5 ± 1,5 µg/g V 17 ± 2 µg/g Na0,192 ± 0,008 % Cu67 ± 3 µg/g Zn0,104 ± 0,005 % Ni18,5 ± 1,5 µg/g	7 g
New NIES28	Urban aerosols - Elements Certified values Na0.796 ± 0.065 % Fe 2.92 ± 0.17 % As 90.2 ± 10.7 mg/kg Mg 1.40 ± 0.06 % Zn 0.114 ± 0.010 % Sr 469 ± 16 mg/kg Al5.04 ± 0.10 % V 73.2 ± 7.0 mg/kg Cd 5.60 ± 0.43 mg/kg K 1.37 ± 0.06 % Mn686 ± 42 mg/kg Ba 874 ± 65 mg/kg Ca6.69 ± 0.24 % Ni63.8 ± 3.4 mg/kg Pb 403 ± 32 mg/kg Ti0.292 ± 0.033 % Cu104 ± 12 mg/kg U 4.33 ± 0.26 mg/kg Indicative value for further elements.	15 g
Dust and Fumes		
BCR-605	Urban dust - Trimethyllead Certified value Trimethyllead 7.9 µg/kg	15 g
BCR-723	Road dust - Palladium, platinum and rhodium Certified values Pd 6.1 µg/kg Pt81.3 µg/kg Rh 12.8 µg/kg	25 g
NIST-1648A	Urban particulate matter - Constituent elements Certified values Al.....3.42 % Cr.....402 mg/kg Pb0.655 % As..... 115 mg/kg Cu610 mg/kg Rb 51.0 mg/kg Br 502 mg/kg Fe 3.92 % S 5.51 % Ca 5.84 % K 1.056 % Sb 45.4 mg/kg Cd 75 mg/kg Mg 0.813 % Sr 215 mg/kg Ce 54.6 mg/kg Mn790 mg/kg Ti 4021 mg/kg Cl 4543 mg/kg Na4240 mg/kg V 127 mg/kg Co 17.93 mg/kg Ni81.1 mg/kg Zn 4800 mg/kg Indicative values for Ag, B, Cs, La, Se, Si, Sm and W	2 g

Code	Product	Unit																																																				
New NIST-1649B	Urban dust - Organic contaminants	2.5 g																																																				
<p>This Standard Reference Material® (SRM®) is an atmospheric particulate material collected in an urban area and is intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, and chlorinated pesticides in atmospheric particulate material and similar matrices. Reference values are also provided for nitro-substituted polycyclic aromatic hydrocarbons (nitro-PAHs), decabromodiphenyl ether, toxaphene congeners, and polychlorinated dibenzo-p-dioxin and dibenzofuran congeners. Information concentration values are provided for selected hydrocarbons, hopanes, steranes, ketones, and particle-size characteristics. All of the constituents for which certified, reference, and information values are provided in NIST-1649B are naturally present in the particulate material.</p>																																																						
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Chrysene	3.008 ± 0.044	Dibenz[a,h]anthracene	0.290 ± 0.004																																																			
Triphenylene	1.244 ± 0.052	Picene	0.390 ± 0.028																																																			
Benzo[b]fluoranthene	5.99 ± 0.20	Dibenzo[b,k]fluoranthene	0.655 ± 0.035																																																			
Benzo[j]fluoranthene	1.731 ± 0.083	Dibenzo[a,e]pyrene	0.538 ± 0.024																																																			
Benzo[k]fluoranthene	1.748 ± 0.083																																																					
Certified concentrations for selected PCB congeners																																																						
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BCR-553-4	Formaldehyde-2,4-dinitrophenyl-hydrazone on filter	set
Set of 2 x BCR 553 & 1 x BCR 554 (blank)		
<u>BCR-553 (spiked filter)</u>		
Certified value (per filter)		
Formaldehyde-2,4-dinitrophenylhydrazone.....4.96 µg		
<u>BCR-554 (blank filter)</u>		
Certified value (per filter)		
Formaldehyde-2,4-dinitrophenylhydrazone..... < 0.1µg		

Ash, particulate and dust

Code	Product	Unit												
	<p>BCR-555</p> <p>Council directive 80/1107/EEC and national legislation prescribes that the exposure of each individual worker to certain potentially harmful vapours has to be monitored periodically. This requires "personal monitoring" where a tube, containing a suitable sorbing agent, is attached to the worker's clothes. After a set sampling period any harmful vapours absorbed onto the material in the tube are desorbed, either by heating or solvent extraction, and determined using gas chromatography.</p>													
BCR-555	<p>Tenax charged tube - Chlorinated hydrocarbons</p> <p>Stainless steel tube of 9.0 cm length and 0.25 inches outer diameter containing a single section of 250 mg TENAX GR, charged with 4 chlorinated hydrocarbons and toluene at the levels shown above.</p> <p>Certified values</p> <table> <tr> <td>Dichloromethane.....</td> <td>320 ng</td> <td>Trichloroethylene.....</td> <td>390 ng</td> <td>Toluene.....</td> <td>57 ng</td> </tr> <tr> <td>1,1,1-Trichloroethane.....</td> <td>370 ng</td> <td>Perchloroethylene</td> <td>327 ng</td> <td></td> <td></td> </tr> </table>	Dichloromethane.....	320 ng	Trichloroethylene.....	390 ng	Toluene.....	57 ng	1,1,1-Trichloroethane.....	370 ng	Perchloroethylene	327 ng			tube
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1,1,1-Trichloroethane.....	370 ng	Perchloroethylene	327 ng											
RTC-CRM014-050	<p>Baghouse dust - Trace metals</p> <p>Certified values</p> <p>Lot V014</p> <table> <tr> <td>Cd</td> <td>510 mg/kg</td> <td>Cr.....</td> <td>2230 mg/kg</td> <td>Pb</td> <td>1910 mg/kg</td> </tr> </table>	Cd	510 mg/kg	Cr.....	2230 mg/kg	Pb	1910 mg/kg	50 g						
Cd	510 mg/kg	Cr.....	2230 mg/kg	Pb	1910 mg/kg									
NIST-1878a	<p>Respirable alpha quartz</p> <p>One form of respirable silica</p> <p>Certified value</p> <p>Crystalline α-quartz.....</p> <p>93.7 % \pm 0.21 %</p>	5 g												
NIST-1879a	<p>Respirable cristabolite</p> <p>One form of respirable silica</p> <p>Certified value</p> <p>Crystalline cristabolite</p> <p>95.6 %</p>	5 g												

Code	Product	Unit
NIST-2585	This Standard Reference Material® (SRM®) is a house dust intended for use in evaluating analytical methods for the determination of selected polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyl (PCB) congeners, chlorinated pesticides, and polybrominated diphenyl ether (PBDE) congeners in house dust and similar matrices.	10 g

Certified Concentrations for Selected PAHs

Mass Fraction (dry-mass basis)		Mass Fraction (dry-mass basis)	
Naphthalene	266 ± 8 µg/kg	Benzo[j]fluoranthene	1320 ± 110 µg/kg
Dibenzothiophene	109 ± 8 µg/kg	Benzo[k]fluoranthene	1330 ± 70 µg/kg
Phenanthrene	1920 ± 20 µg/kg	Benzo[a]fluoranthene	74.5 ± 8.1 µg/kg
Anthracene	96.0 ± 5.2 µg/kg	Benzo[e]pyrene	2160 ± 80 µg/kg
4H-cyclopenta[def]phenanthrene	117 ± 10 µg/kg	Benzo[a]pyrene	1140 ± 10 µg/kg
3-Methylphenanthrene	293 ± 36 µg/kg	Perylene	387 ± 23 µg/kg
2-Methylphenanthrene	352 ± 40 µg/kg	Benzo[ghi]perylene	2280 ± 40 µg/kg
9-Methylphenanthrene	205 ± 16 µg/kg	Indeno[1,2,3-cd]pyrene	2080 ± 100 µg/kg
1-Methylphenanthrene	197 ± 29 µg/kg	Dibenz[a,i]anthracene	267 ± 9 µg/kg
Fluoranthene	4380 ± 100 µg/kg	Dibenz[a,c]anthracene	183 ± 25 µg/kg
Pyrene	3290 ± 30 µg/kg	Dibenz[a,h]anthracene	301 ± 50 µg/kg
Benzo[ghi]fluoranthene	317 ± 11 µg/kg	Benzo[b]chrysene	182 ± 6 µg/kg
Benzo[c]phenanthrene	288 ± 10 µg/kg	Picene	413 ± 15 µg/kg
Benzo[a]anthracene	1160 ± 54 µg/kg	Coronene	603 ± 38 µg/kg
Chrysene	2260 ± 60 µg/kg	Dibenzo[b,k]fluoranthene	596 ± 22 µg/kg
Triphenylene	589 ± 17 µg/kg	Dibenzo[a,e]pyrene	477 ± 67 µg/kg
Benzo[b]fluoranthene	2700 ± 90 µg/kg		

Certified Concentrations for Selected PCB Congeners

Mass Fraction (dry-mass basis)	
PCB 18 (2,2',5-Trichlorobiphenyl)	12.8 ± 1.0 µg/kg
PCB 28 (2,4,4'-Trichlorobiphenyl)	13.4 ± 0.5 µg/kg
PCB 31 (2,4',5-Trichlorobiphenyl)	14.0 ± 0.5 µg/kg
PCB 44 (2,2',3,5'-Tetrachlorobiphenyl)	18.1 ± 1.9 µg/kg
PCB 52 (2,2',5,5'-Tetrachlorobiphenyl)	21.8 ± 1.9 µg/kg
PCB 56 (2,3,3',4-Tetrachlorobiphenyl)	4.42 ± 0.28 µg/kg
PCB 70 (2,3',4',5-Tetrachlorobiphenyl)	13.1 ± 1.2 µg/kg
PCB 74 (2,4,4',5-Tetrachlorobiphenyl)	5.22 ± 0.51 µg/kg
PCB 87 (2,2',3,4,5'-Pentachlorobiphenyl)	16.6 ± 0.8 µg/kg
PCB 92 (2,2',3,5,5'-Pentachlorobiphenyl)	5.48 ± 0.72 µg/kg
PCB 95 (2,2',3,5',6-Pentachlorobiphenyl)	22.7 ± 2.6 µg/kg
PCB 99 (2,2',4,4',5-Pentachlorobiphenyl)	11.6 ± 0.4 µg/kg
PCB 101 (2,2',4,5,5'-Pentachlorobiphenyl)	29.8 ± 2.3 µg/kg
PCB 105 (2,3,3',4,4'-Pentachlorobiphenyl)	13.2 ± 1.4 µg/kg
PCB 107 (2,3,3',4,5'-Pentachlorobiphenyl)	4.14 ± 0.47 µg/kg
PCB 110 (2,3,3',4',6-Pentachlorobiphenyl)	28.1 ± 3.7 µg/kg
PCB 118 (2,3',4,4',5-Pentachlorobiphenyl)	26.3 ± 1.7 µg/kg
PCB 138 (2,2',3,4,4',5'-Hexachlorobiphenyl)	27.6 ± 2.1 µg/kg
PCB 146 (2,2',3,4',5,5'-Hexachlorobiphenyl)	4.89 ± 0.38 µg/kg
PCB 149 (2,2',3,4',5',6-Hexachlorobiphenyl)	24.4 ± 1.9 µg/kg
PCB 151 (2,2',3,5,5',6-Hexachlorobiphenyl)	6.92 ± 0.64 µg/kg
PCB 153 (2,2',4,4',5,5'-Hexachlorobiphenyl)	40.2 ± 1.8 µg/kg
PCB 132 (2,2',3,3',4,6'-Hexachlorobiphenyl)	
PCB 158 (2,3,3',4,4',6-Hexachlorobiphenyl)	4.50 ± 0.43 µg/kg
PCB 163 (2,3,3',4',5,6-Hexachlorobiphenyl)	7.2 ± 1.2 µg/kg
PCB 170 (2,2',3,3',4,4',5-Heptachlorobiphenyl)	8.8 ± 1.0 µg/kg
PCB 174 (2,2',3,3',4,5,6'-Heptachlorobiphenyl)	8.83 ± 0.47 µg/kg
PCB 180 (2,2',3,4,4',5,5'-Heptachlorobiphenyl)	18.4 ± 3.2 µg/kg
PCB 183 (2,2',3,4,4',5',6-Heptachlorobiphenyl)	5.27 ± 0.39 µg/kg
PCB 187 (2,2',3,4',5,5',6-Heptachlorobiphenyl)	11.3 ± 1.4 µg/kg
PCB 206 (2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl)	3.81 ± 0.13 µg/kg

Certified Concentrations for Selected Chlorinated Pesticides

Mass Fraction (dry-mass basis)	Mass Fraction (dry-mass basis)	Mass Fraction (dry-mass basis)	
4,4'-DDE	261 ± 2 µg/kg	2,4'-DDT	44.5 ± 3.9 µg/kg
4,4'-DDD	27.3 ± 0.8 µg/kg	4,4'-DDT	111 ± 23 µg/kg

Certified Concentrations for Selected PBDE Congeners

Mass Fraction (dry-mass basis)	
PBDE 17 (2,2',4-Tribromodiphenyl ether)	11.5 ± 1.2 µg/kg
PBDE 28 (2,4,4'-Tribromodiphenyl ether)	46.9 ± 4.4 µg/kg
PBDE 33 (2',3,4-Tribromodiphenyl ether)	
PBDE 47 (2,2',4,4'-Tetrabromodiphenyl ether)	497 ± 46 µg/kg
PBDE 49 (2,2',4,5'-Tetrabromodiphenyl ether)	53.5 ± 4.2 µg/kg
PBDE 85 (2,2',3,4,4'-Pentabromodiphenyl ether)	43.8 ± 1.6 µg/kg
PBDE 99 (2,2',4,4',5-Pentabromodiphenyl ether)	892 ± 53 µg/kg
PBDE 100 (2,2',4,4',6-Pentabromodiphenyl ether)	145 ± 11 µg/kg
PBDE 138 (2,2',3,4,4',5'-Hexabromodiphenylether)	15.2 ± 2.0 µg/kg
PBDE 153 (2,2',4,4',5,5'-Hexabromodiphenyl ether)	119 ± 1 µg/kg
PBDE 154 (2,2',4,4',5,6'-Hexabromodiphenyl ether)	83.5 ± 2.0 µg/kg
PBDE 155 (2,2',4,4',6,6'-Hexabromodiphenyl ether)	3.94 ± 0.34 µg/kg
PBDE 183 (2,2',3,4,4',5',6-Heptabromodiphenyl ether)	43.0 ± 3.5 µg/kg
PBDE 203 (2,2',3,4,4',5,6',6-Octabromodiphenyl ether)	36.7 ± 6.4 µg/kg
PBDE 206 (2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether)	271 ± 42 µg/kg
PBDE 209 (Decabromodiphenyl ether)	2510 ± 190 µg/kg

Reference values for PAHs, PCBs, Pesticides, PBDEs

Occupational hygiene reference materials

Code	Product	Unit
NIST-2583	Indoor dust - Trace elements Certified values As..... 7.0 mg/kg Cr..... 80 mg/kg Pb 85.9 mg/kg Cd 7.3 mg/kg Hg..... 1.56 mg/kg	8 g
NIST-2584	Indoor dust - Trace elements Collected from vacuum cleaner bags used in the cleaning of interior dwelling places Certified values As..... 17.4 mg/kg Cr..... 135.0 mg/kg Pb 9761 mg/kg Cd 10.0 mg/kg Hg..... 5.20 mg/kg Indicative values for a wide range of additional elements	8 g
ERM-CZ100 and ERM-CZ120 The European Air Quality Directive, specifically 2008/50/EC and 2004/107/EC require the monitoring of arsenic, cadmium, nickel, lead and several polycyclic aromatic hydrocarbons (PAHs) in PM ₁₀ (particulate matter of 10 µm and less aerodynamic diameter) in ambient air.		
New ERM-CZ100	Fine dust (PM ₁₀ -like) – PAHs PM ₁₀ (particulate matter of 10 µm and less aerodynamic diameter) Certified values Benzo[a]anthracene.....0.91 ± 0.07 mg/kg Benzo[a]pyrene.....0.72 ± 0.05 mg/kg Benzo[b]fluoranthene.....1.42 ± 0.14 mg/kg Benzo[j]fluoranthene.....0.75 ± 0.14 mg/kg Benzo[k]fluoranthene.....0.67 ± 0.06 mg/kg Dibenzo[a,h]anthracene.....0.18 ± 0.04 mg/kg Indeno[1,2,3,-c-d]pyrene.....1.07 ± 0.10 mg/kg Sum of benzo[b]fluoranthene,.....2.84 ± 0.21 mg/kg benzo[k]fluoranthene and benzo[j]fluoranthene Indicative values for further PAHs	0.5 g
New ERM-CZ120	Fine dust (PM ₁₀ -like) - As, Cd, Pb and Ni PM ₁₀ (particulate matter of 10 µm and less aerodynamic diameter) Certified values Arsenic (As)7.1 ± 0.7 mg/kg Lead (Pb) 113 ± 17 mg/kg Cadmium (Cd)0.90 ± 0.22 mg/kg Nickel (Ni) 58 ± 7 mg/kg Indicative values for further elements.	0.5 g

Occupational hygiene reference materials

Filter media

Code	Product	Unit
BCR-545	Glass fibre filter - Chromium Welding dust loaded on a filter. Certified values Cr (VI)40.2 g/kg total leachable Cr..... 39.5 g/kg	filter
NAMI() A-3 and NAMI() B-3 Intended for use in conjunction with measurements of elements in air filters collected from work-room air. The 37 mm cellulose ester membrane filters were prepared by spiking each filter with an aqueous solution containing 25 elements with concentrations gravimetrically traceable to ultrapure metals or stoichiometrically well defined oxides. The levels correspond to current threshold limit values of contaminants in workroom atmospheres (provided that the simulated filter has been exposed to one cubic meter of air). The certified values are based on a gravimetric procedure, i.e. weight per volume composition of the primary reference material dissolved in high purity sub-distilled acids.		
NAMI(1)/A-3	Cellulose ester membrane filter - Metals Certified values Al.....225 ± 1 µg Fe 521 ± 2 µg Sn37.7 ± 0.1 µg As.....7.65 ± 0.05 µg Mg 74.5 ± 0.4 µg Sr35.2 ± 0.1 µg Ba37.4 ± 0.1 µg Mn 150 ± 1 µg Ti37.0 ± 0.1 µg Be1.48 ± 0.01 µg Mo 37.6 ± 0.2 µg Tl2.61 ± 0.01 µg Cd15.0 ± 0.1 µg Ni 60.3 ± 0.2 µg V15.5 ± 0.1 µg Co37.3 ± 0.1 µg Pb 37.0 ± 0.1 µg Zn226 ± 1 µg Cr47.8 ± 0.3 µg Pt 35.2 ± 0.1 µg Zr37.3 ± 0.2 µg Cu75.0 ± 0.4 µg Sb 37.5 ± 0.1 µg Indicative values for B, W	filter
NAMI(5)/A-3	Cellulose ester membrane filter - Metals	5 filter

Code	Product	Unit
NAMI(1)/B-3	Cellulose ester membrane filter - Metals Certified values	filter
	Al..... 110 ± 1 µg Fe 256 ± 3 µg Sn 18.6 ± 0.2 µg As..... 3.76 ± 0.04 µg Mg 36.6 ± 0.4 µg Sr 17.3 ± 0.2 µg Ba 18.4 ± 0.2 µg Mn 73.6 ± 0.8 µg Ti 17.8 ± 0.4 µg Be 0.73 ± 0.01 µg Mo 15.9 ± 0.3 µg Tl 1.28 ± 0.01 µg Cd 7.35 ± 0.07 µg Ni 29.7 ± 0.3 µg V 7.61 ± 0.08 µg Co 18.3 ± 0.2 µg Pb 18.2 ± 0.2 µg Zn 111 ± 1 µg Cr 23.5 ± 0.2 µg Pt 17.3 ± 0.2 µg Zr 18.3 ± 0.2 µg Cu 36.9 ± 0.4 µg Sb 18.4 ± 0.2 µg	
	Indicative values for B, W	
NAMI(5)/B-3	Cellulose ester membrane filter - Metals	5 filter
NIST-2951	Respirable alpha quartz on filter media, 5 µg A unit of NIST-2951 consists of five filters, each containing a nominal mass of 5 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2952	Respirable alpha quartz on filter media, 10 µg A unit of NIST-2952 consists of five filters, each containing a nominal mass of 10 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2953	Respirable alpha quartz on filter media, 20 µg A unit of NIST-2953 consists of five filters, each containing a nominal mass of 20 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2954	Respirable alpha quartz on filter media, 50 µg A unit of NIST-2954 consists of five filters, each containing a nominal mass of 50 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2955	Respirable alpha quartz on filter media, 100 µg A unit of NIST-2955 consists of five filters, each containing a nominal mass of 100 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2956	Respirable alpha quartz on filter media, 250 µg A unit of NIST-2956 consists of five filters, each containing a nominal mass of 250 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2957	Respirable alpha quartz on filter media, 500 µg A unit of NIST-2957 consists of five filters, each containing a nominal mass of 500 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2958	Respirable alpha quartz on filter media, 1000 µg A unit of NIST-2958 consists of five filters, each containing a nominal mass of 1000 µg of respirable alpha quartz. The SRM is provided with five blank PVC filters containing no alpha quartz.	set
NIST-2950	Respirable alpha quartz on filter media, 10-500 µg Each unit of NIST-2950 consists of one unit each of NIST 2952, 2953, 2954, 2955, 2956, and 2957.	set
NIST-2961	Respirable cristobalite on filter media, 5 µg A unit of NIST-2961 consists of five filters, each containing a nominal mass of 5 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2962	Respirable cristobalite on filter media, 10 µg A unit of NIST-2962 consists of five filters, each containing a nominal mass of 10 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2963	Respirable cristobalite on filter media, 20 µg A unit of NIST-2963 consists of five filters, each containing a nominal mass of 20 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2964	Respirable cristobalite on filter media, 50 µg A unit of NIST-2964 consists of five filters, each containing a nominal mass of 50 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2965	Respirable cristobalite on filter media, 100 µg A unit of NIST-2965 consists of five filters, each containing a nominal mass of 100 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2966	Respirable cristobalite on filter media, 250 µg A unit of NIST-2966 consists of five filters, each containing a nominal mass of 250 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2966	Respirable cristobalite on filter media, 250 µg A unit of NIST-2966 consists of five filters, each containing a nominal mass of 250 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2960	Respirable cristobalite on filter media, 5 - 250 µg NIST-2960 consists of one unit each of NIST-2961, 2962, 2963, 2964, 2965, and 2966. Each unit of NIST-2961, 2962, 2963, 2964, 2965, and 2966 consists of five blank PVC filters containing no cristobalite and five loaded PVC filters containing a known mass of respirable cristobalite.	set

Respirable materials (solid form)

Code	Product	Unit
NIST-2967	Respirable cristobalite on filter media, 500 µg A unit of NIST-2967 consists of five filters, each containing a nominal mass of 500 µg of respirable cristobalite and is provided with five blank PVC filters containing no cristobalite.	set
NIST-2783	Air particulate on filter media - Trace elements This Standard Reference Material is an air particulate sample reduced in particle size to simulate PM _{2.5} air particulate matter (particles with an aerodynamic equivalent diameter of 2.5 µm) and deposited on a polycarbonate filter membrane. NIST-2783 included two loaded filters and two blank filters. Certified values Al..... 23210 ng Cu..... 404 ng Ni 68 ng As..... 11.8 ng Fe 26500 ng Pb 317 ng Ba 335 ng K..... 5280 ng Sb 71.8 ng Ca 13200 ng Mg 8620 ng Ti 1490 ng Co 7.7 ng Mn 320 ng V 48.5 ng Cr 135 ng Na..... 2860 ng Zn..... 1790 ng Indicative values for Ce, Rb, S, Sc, Si, SM, Th, U, W	4 filter
NIST-RM 8785	Filter media - Air particulate matter This Reference Material NIST-RM 8785 is intended primarily for use in the evaluation of analytical methods used to characterise the carbon composition of atmospheric fine-particulate matter (PM) for national air quality monitoring programs. This RM consists of only the fine fraction (nominally < 2.5 µm aerodynamic diameter) of NIST-1649a Urban Dust resuspended in air and filtered onto quartz-fiber filter. NIST-RM 8785 also provides the atmospheric chemistry and ocean-sciences community with a means to inter-compare methods and laboratories for the measurement of elemental (black) carbon. RM 8785 has value-assignments for total carbon, elemental carbon and organic carbon measured according to two thermal-optical methods: the NIOSH and IMPROVE protocols. A unit of NIST-RM 8785 consists of three loaded filters, each uniquely identified by its APM identification number (e.g., APM 1257), its production characteristics, i.e., batch and chamber-column-row (e.g., 12959-30 and IV-D-5, respectively) and its mass of fine NIST-1649a on the filter (e.g., 1948 µg).	3 filter
NIST-RM 8786	Filter blank for NIST-RM 8785 A unit of NIST-RM 8786 consists of a single production blank filter with a 37 mm diameter	filter
NIST-2678	Blank cellulose acetate membrane filter Set of 10 blank filters Intended for use in evaluating the performance of air sampling filter methods. Certified values or limits of detection for each of 30 constituent elements as well as 6 leachable anions and cations.	set (10)
NIST-2681	Blank ashless filter - Trace elements Intended for use in evaluating the performance of air sampling filter methods. Certified values or limits of detection for each of 30 constituent elements as well as 6 leachable anions and cations.	set (10)
RTC-CRM002-100	Activated charcoal filter - Trace elements From a commercial water treatment system. Certified values Lot AZ02 Ag 18.3 mg/kg Cr..... 36000 mg/kg Cu 96900 mg/kg Indicative values for 22 further elements	100 g
RTC-CRM004-100	Diatomaceous earth filter - Trace elements From a commercial water treatment system in the Eastern United States. Certified values Lot AY04 Ba 1590 mg/kg Cr..... 21.4 mg/kg Cd 2.4 mg/kg Pb..... 11900 mg/kg Indicative values for 20 further elements	100 g

Respirable materials (solid form)

Code	Product	Unit
New NIST-1877	Beryllium oxide powder Certified value Beryllium mass fraction..... 0.3576 ± 0.0024 g/g Indicative values for specific surface area, specific gravity, count median diameter (CMD) and size distribution of the primary beryllium oxide particles, mass median diameter (MMD) and size distribution of the primary beryllium oxide particles.	20 g
NIST-1878a	Respirable alpha quartz One form of respirable silica Certified value Crystalline α-quartz..... 93.7 % ± 0.21 %	5 g

Code	Product	Unit
NIST-1879a	Respirable cristabolite One form of respirable silica Certified value Crystalline cristabolite..... 95.6 %	5 g

Food matrix reference materials

Milk and milk products

Code	Product	Unit
LGC7104	Sterilised cream - Proximates and nutrient elements LGC7104 is a cream product, sealed in cans in 170g portions. Assessed values Moisture 70.2 g/100 g Nitrogen 0.40 g/100 g Total fat..... 22.7 g/100 g Ash..... 0.58 g/100 g Ca..... 845 mg/kg K..... 1160 mg/kg Mg 84 mg/kg Na..... 505 mg/kg P 823mg/kg Zn..... 3.1 mg/kg Indicative values for Cl, Lactose	170 g
BCR-380R	Whole milk powder - Major nutrients Certified values Crude protein28.66 ± 0.28 g/100 g (Kjeldahl-N x 6.38) Fat.....26.95 ± 0.16 g/100 g Lactose (anhydrous).....37.1 ± 1.0 g/100 g Ash.....6.00 ± 0.13 g/100 g	100 g
BCR-685	Skimmed milk powder - Major nutrients Certified values Crude protein38.2 ± 0.4 g/100 g (Kjeldahl-N x 6.38) Fat.....0.96 ± 0.12 g/100 g	50 g
BCR-063R	Skimmed milk powder - Major and trace elements Natural elemental levels in skim milk powder. Certified values Ca 13.49 mg/g Cl 9.94 mg/g Cu 0.602 µg/g Fe..... 2.32 µg/g I 0.81 µg/g K..... 17.68 mg/g Mg 1.263 mg/g N (total) 62.3 mg/g Na 4.37 mg/g P 11.10 mg/g Pb 18.5 ng/g Zn..... 49.0 µg/g	50 g
BCR-150	Spiked skimmed milk powder - Trace elements Milk spiked with Cd, Cu, Fe and Hg. Certified values Cd 21.8 µg/kg Cu 2.23 mg/kg Fe 11.8 mg/kg Hg..... 9.4 µg/kg I..... 1.29 mg/kg Pb 1.00 mg/kg Indicative values for Co, Mn, Ni, Se, Ti, Zn	23 g
BCR-151	Spiked skimmed milk powder - Trace elements Milk spiked with Cd, Cu, Fe and Hg. Certified values Cd 101.0 µg/kg Cu 5.23 mg/kg Fe 50.1 mg/kg Hg..... 101 µg/kg I..... 5.35 mg/kg Pb 2002 mg/kg Indicative values for Co, Mn, Ni, Se, Ti, Zn	23 g
NIST-1549	Non-fat milk powder - Trace elements Certified values Ca 1.30 % Cd 0.0005 mg/kg Cl 1.09 % Cr 0.0026 mg/kg Cu 0.7 mg/kg I 3.38 mg/kg Fe 1.78 mg/kg Hg..... 0.0003 mg/kg K..... 1.69 % Mg 0.120 % Mn 0.26 mg/kg Na..... 0.497 % P 1.06 % Pb 0.019 mg/kg S 0.351 % Se 0.11 mg/kg Zn..... 46.1 mg/kg Indicative values for Ag, Al, As, Br, Co, F, Mo, Rb, Sb, Sn	100 g
IAEA-153	Milk powder - Trace elements Certified values Br 12.3 mg/kg Ca 12870 mg/kg Fe..... 2.53 mg/kg K..... 17620 mg/kg Mg 1060 mg/kg Na..... 4180 mg/kg P 10100 mg/kg Rb 14 mg/kg Zn..... 39.6 mg/kg Indicative values for Cu, Mn, Mo, Sr	50 g