

Code	Product	Unit
NJV 94-3	Energy forest (salix) - Trace elements Salix cultivated in Sweden. Certified values Ca 0.44 % Mg 0.034 % Zn 75 mg/kg Cd 1.8 mg/kg Mn 0.006 % Ash 1.56 % Cu 4.0 mg/kg N 0.37 % Calorific value 19.5 MJ/kg Fe 0.0026 % P 0.05 % K 0.20 % S 0.028 % Indicative values for Al, C, Cl, H, Na, Si, Pb, Volatile matter	50 g
NJV 94-4	Energy grass (phalaris arudinaceae L.) - Trace elements Spring harvested reed canary grass (Phalaris arudinaceae L.) from Sweden. Certified values Al 0.18 % Fe 0.106 % S 0.132 % As 0.4 mg/kg K 0.38 % Si 2.1 % Ca 0.21 % Mg 0.088 % Zn 42 mg/kg Cd 0.09 mg/kg Mn 0.016 % Ash 6.87 % Cl 0.058 % N 1.04 % Calorific value 18.5 MJ/kg Cr 3.4 mg/kg P 0.109 % Cu 6.8 mg/kg Pb 2.1 mg/kg Indicative values for C, H, Na, Ti, Volatile matter	50 g
NJV 94-5	Wood fuel - Trace elements Pine wood waste from a saw mill in Sweden with a composition of approximately 70:30 bark: chip Certified values Al 0.026 % Fe 0.007 % Pb 0.68 mg/kg As 0.8 mg/kg K 0.09 % S 0.018 % Ca 0.35 % Mg 0.030 % Zn 38 mg/kg Cd 0.27 mg/kg Mn 0.021 % Ash 1.22 % Cr 0.8 mg/kg Na 0.004 % Calorific value 20.6 MJ/kg Cu 2.2 mg/kg P 0.021 % Indicative values for C, Cl, H, N, Si, Ti, Volatile matter	50 g

Cement

Code	Product	Unit
NIST-634a	Portland cement - Constituents Certified values SiO ₂ 20.493 % CaO 65.07 % K ₂ O 0.3572 % Al ₂ O ₃ 5.015 % MgO 1.0057 % TiO ₂ 0.2463 % Fe ₂ O ₃ 3.362 % SO ₃ 2.780 % P ₂ O ₅ 0.1767 % Indicative values for Na ₂ O, Cr ₂ O ₃ , ZnO, Mn ₂ O ₃ , SrO	100 g
New NIST-1880B	Portland cement - Constituents Certified values SiO ₂ 20.42 ± 0.36 % SO ₃ 2.710 ± 0.099 % Mn ₂ O ₃ 0.1981 ± 0.0020 % Al ₂ O ₃ 5.183 ± 0.073 % Na ₂ O 0.0914 ± 0.0052 % Cl 0.01830 ± 0.00057 % Fe ₂ O ₃ 3.681 ± 0.023 % K ₂ O 0.646 ± 0.014 % Cr ₂ O ₃ 0.01927 ± 0.00042 % CaO 64.16 ± 0.40 % TiO ₂ 0.236 ± 0.012 % MgO 1.176 ± 0.020 % P ₂ O ₅ 0.2443 ± 0.0027 % Reference values for LOI*, ZnO, sulfide sulfur, insoluble residue, CaO (free), SrO, and fluoride * Loss on Ignition	4 x 5 g
NIST-1881a	Portland cement - Constituents Certified values Al ₂ O ₃ 7.060 % MgO 2.981 % SO ₃ 3.366 % CaO 57.58 % Mn ₂ O ₃ 0.013 % SrO 0.036 % Cr ₂ O ₃ 0.0588 % Na ₂ O 0.199 % TiO ₂ 0.3663 % Fe ₂ O ₃ 3.09 % P ₂ O ₅ 0.1459 % ZnO 0.0489 K ₂ O 1.228 % SiO ₂ 22.26 % Indicative values for Cl, F, LOI*, Insoluble residue * Loss on Ignition	4 x 5 g
NIST-1882a	Calcium aluminate cement (formally orange) - Constituents Certified values Al ₂ O ₃ 39.14 % MgO 0.51 % SrO 0.024 % CaO 39.29 % Mn ₂ O ₃ 0.060 % TiO ₂ 1.786 % Cr ₂ O ₃ 0.113 % Na ₂ O 0.021 % ZnO 0.004 % Fe ₂ O ₃ 14.67 % P ₂ O ₅ 0.070 % LOI* 0.20 % K ₂ O 0.051 % SiO ₂ 4.01 % Indicative value for Total * Loss on Ignition	4 x 5 g

Cement

Code	Product	Unit
NIST-1883a	Calcium aluminate cement (formally silver) - Constituents Certified values Al ₂ O ₃ 70.04 % K ₂ O 0.014 % SiO ₂ 0.24 % % CaO 29.52 % MgO 0.19 % Fe ₂ O ₃ 0.078 % Na ₂ O 0.30 % Indicative values for Cr ₂ O ₃ , P ₂ O ₅ , SrO, TiO ₂ , LOI*, Total * Loss on Ignition	4 x 5 g
New NIST-1884B	Portland cement - Constituents This Standard Reference Material® (SRM®) is intended primarily for the evaluation or calibration of methods for analysis of cements and materials of similar matrix. A unit of SRM 1884b consists of five sealed vials, each containing approximately 4.5 g of portland cement ground to pass through a 75 µm (No. 200) sieve. Certified values for NIST1884b SiO ₂ 19.30 ± 0.18 % SO ₃ 4.034 ± 0.067 % Mn ₂ O ₃ 0.0750 ± 0.0013 % Al ₂ O ₃ 4.851 ± 0.021 % Na ₂ O 0.278 ± 0.010 % Cr ₂ O ₃ 0.00791 ± 0.00070 % Fe ₂ O ₃ 2.937 ± 0.020 % K ₂ O 0.957 ± 0.018 % SrO 0.0258 ± 0.0038 % CaO 61.31 ± 0.36 % TiO ₂ 0.2651 ± 0.0084 % MgO 4.74 ± 0.13 % P ₂ O ₅ 0.0965 ± 0.0033 % Indicative values for LOI, ZnO, Cl, sulfide sulfur, insoluble residue, free CaO, fluoride (F)	4 x 5 g
NIST-1885a	Portland cement - Constituents Certified values Al ₂ O ₃ 4.026 % MgO 4.033 % SO ₃ 2.830 % CaO 62.39 % Mn ₂ O ₃ 0.0478 % SrO 0.638 % Cr ₂ O ₃ 0.0195 % Na ₂ O 1.068 % TiO ₂ 0.195 % Fe ₂ O ₃ 1.929 % P ₂ O ₅ 0.1220 % K ₂ O 0.206 % SiO ₂ 20.909 % Indicative values for ZnO, F, LOI*, Total, Insoluble residues, free CaO * Loss on Ignition	4 x 5 g
NIST-1886A	Portland cement (cranberry) - Constituents Certified values Al ₂ O ₃ 3.99 % Mn ₂ O ₃ 0.013 % SrO 0.11 % CaO 67.43 % Na ₂ O 0.02 % TiO ₂ 0.19 % Fe ₂ O ₃ 0.31 % P ₂ O ₅ 0.025 % LOI* 1.73 % K ₂ O 0.16 % SiO ₂ 22.53 % MgO 1.60 % SO ₃ 2.04 % Indicative values for Cl, Cr ₂ O ₃ , F, ZnO, Total * Loss on Ignition	4 x 5 g
NIST-1887a	Portland cement - Constituents Certified values Al ₂ O ₃ 6.202 % Mn ₂ O ₃ 0.1186 % SrO 0.322 % CaO 60.90 % Na ₂ O 0.4778 % TiO ₂ 0.2658 % Fe ₂ O ₃ 2.861 % P ₂ O ₅ 0.306 % ZnO 0.0667 % K ₂ O 1.100 % SiO ₂ 18.637 % MgO 2.835 % SO ₃ 4.622 % Indicative values for Cl, F, LOI*, Total, Insoluble residues, free CaO * Loss on Ignition	4 x 5 g
New NIST-1888B	Portland cement - Constituents Certified values SiO ₂ 20.42 ± 0.23 % K ₂ O 0.658 ± 0.017 % Al ₂ O ₃ 4.277 ± 0.036 % TiO ₂ 0.2316 ± 0.0076 % Fe ₂ O ₃ 3.062 ± 0.053 % P ₂ O ₅ 0.07307 ± 0.00081 % CaO 63.13 ± 0.29 % Mn ₂ O ₃ 0.0652 ± 0.0022 % MgO 3.562 ± 0.057 % Cl 0.0143 ± 0.0015 % SO ₃ 2.634 ± 0.017 % SrO 0.1009 ± 0.0030 % Na ₂ O 0.1364 ± 0.0044 % Reference values for Cr ₂ O ₃ , ZnO, Sulfide Sulfur, Insoluble Residue, Free CaO, Fluoride, LOI at different temperatures	4 x 5 g
NIST-1889a	Portland cement - Constituents Certified values Al ₂ O ₃ 3.89 % Mn ₂ O ₃ 0.2588 % SrO 0.042 % CaO 65.34 % Na ₂ O 0.195 % TiO ₂ 0.227 % Fe ₂ O ₃ 1.937 % P ₂ O ₅ 0.110 % ZnO 0.0048 % K ₂ O 0.605 % SiO ₂ 20.66 % MgO 0.814 % SO ₃ 2.69 % Indicative values for Cl, F, LOI*, Total, Insoluble residues, free CaO * Loss on Ignition	4 x 5 g
New NIST-2686A	Portland cement clinker - Major phases Major phases in cement clinker Certified values Alite 63.53 % Ferrite 10.8 % Periclase 3.4 % Belite 18.8 % Aluminate 2.46 % Alkali sulfates 0.86 % Informational values for elemental constituents expressed as the chemical forms.	set (4)

Glass and ceramics

Code	Product	Unit
BCR-126A	Lead glass - Constituents Specially selected glass with a composition that displays many typical analytical problems. Size: 100 x 100 x 10 mm Certified values Al ₂ O ₃ 0.128 cg/g Na ₂ O 3.58 cg/g BaO 1.036 cg/g PbO 23.98 cg/g CaO 1.033 cg/g Sb ₂ O ₃ 0.290 cg/g Fe ₂ O ₃ 0.0055 cg/g SiO ₂ 57.80 cg/g K ₂ O 10.00 cg/g ZnO 1.020 cg/g Li ₂ O 0.495 cg/g Density (20°C) 2.9905 g/cm ³ MgO 0.512 cg/g Refractive index (20°C) at 589.3nm 1.55967	300 g
BCR-664	Glass - Trace elements Size: 50 x 50 x 7 mm Certified values As 5.9 mg/kg Cl 68.4 mg/kg Pb 53.1 mg/kg Ba 29.1 mg/kg Co 2.77 mg/kg Sb 24.3 mg/kg Cd 5.7 mg/kg Cr 2.65 mg/kg Se 8.6 mg/kg	plate
BCR-301 (RM)	Mullite High crystallinity. Vitreous phase 0.03 g/g. No other phase detected. Impurities: CaO, Fe ₂ O ₃ , K ₂ O, MgO, Na ₂ O, TiO ₂ Values for lattice spacing and relative intensity at five different reflections. Available in granular form to be ground by the user.	50 g
BAM-S004	Glass - hexavalent chromium The certified reference material BAM-S004 consists of container glass for cosmetics. It was crushed into pieces < 10 mm sizes and contains a powdered fraction. Certified values Cr-(VI) 94 ± 5 mg/kg Al ₂ O ₃ (2.15) % K ₂ O (0.16) % Cr-total 471 ± 25 mg/kg BaO (1.2) % Cr ₂ O ₃ (0.07) % SiO ₂ (70.9) % MgO (0.90) % Fe ₂ O ₃ (0.06) % Na ₂ O (14.5) % ZnO (0.33) % CuO (0.04) % CaO (9.4) % SO ₂ (0.17) % (Values in parenthesis are indicative values)	50 g
BAM-S005A	Multielement glass for XRF analysis (soda lime glass) - disc 39 mm x 5 mm (26 g - 30 g) Certified values Arsenic (III) oxide 132 ± 8 mg/kg Tin (IV) oxide 100 ± 7 mg/kg Barium oxide 115 ± 9 mg/kg Sulfur trioxide 1942 ± 85 mg/kg Cadmium oxide 62 ± 4 mg/kg Strontium oxide 151 ± 7 mg/kg Cerium (IV) oxide 105 ± 6 mg/kg Titanium (IV) oxide 164 ± 9 mg/kg Chloride 247 ± 33 mg/kg Vanadium (V) oxide 350 ± 22 mg/kg Cobalt oxide 49.4 ± 2.4 mg/kg Zinc oxide 203 ± 10 mg/kg Chromium (III) oxide 15.6 ± 2.4 mg/kg Zirconium (IV) oxide 842 ± 125 mg/kg Copper (II) oxide 112 ± 5 mg/kg Silicon (IV) oxide (71) % Iron (III) oxide 422 ± 11 mg/kg Sodium oxide (13.7) % Manganese (II) oxide 124 ± 5 mg/kg Calcium oxide (10.5) % Molybdenum (VI) oxide 343 ± 12 mg/kg Magnesium oxide (2.3) % Nickel (II) oxide 59.0 ± 2 mg/kg Aluminium oxide (1.1) % Lead (II) oxide 202 ± 8 mg/kg Potassium oxide (0.7) % Antimony (III) oxide 132 ± 7 mg/kg Selenium 19.6 ± 1.7 mg/kg (Values in parenthesis are indicative values)	disc
BAM-S005B	Multielement glass for XRF analysis (soda lime glass) - disc 39 mm x 5 mm (26 g - 30 g) Certified values Arsenic (III) oxide 132 ± 8 mg/kg Selenium 19.6 ± 1.2 mg/kg Barium oxide 115 ± 5 mg/kg Tin (IV) oxide 100 ± 7 mg/kg Cadmium oxide 62 ± 3 mg/kg Sulfur trioxide 1942 ± 57 mg/kg Cerium (IV) oxide 105 ± 5 mg/kg Strontium oxide 151 ± 7 mg/kg Chloride 247 ± 24 mg/kg Titanium (IV) oxide 163 ± 7 mg/kg Cobalt oxide 49.4 ± 2.3 mg/kg Vanadium (V) oxide 349 ± 22 mg/kg Chromium (III) oxide 15.2 ± 1.2 mg/kg Zinc oxide 203 ± 6 mg/kg Copper (II) oxide 112 ± 4 mg/kg Zirconium (IV) oxide 842 ± 76 mg/kg Iron (III) oxide 422 ± 10 mg/kg Silicon (IV) oxide (71) % Manganese (II) oxide 124 ± 5 mg/kg Sodium oxide (13.7) % Molybdenum (VI) oxide 343 ± 12 mg/kg Calcium oxide (10.5) % Nickel (II) oxide 59.0 ± 1.9 mg/kg Magnesium oxide (2.3) % Lead (II) oxide 202 ± 7 mg/kg Aluminium oxide (1.1) % Antimony (III) oxide 132 ± 6 mg/kg Potassium oxide (0.7) % (Values in parenthesis are indicative values)	disc
NIST-89	Lead-barium glass - Constituents Certified values Cl 0.05 % Fe ₂ O ₃ 0.049 % PbO 17.50 % Al ₂ O ₃ 0.18 % K ₂ O 8.40 % SiO ₂ 63.35 % As ₂ O ₃ 0.03 % MgO 0.03 % SO ₃ 0.03 % As ₂ O ₅ 0.36 % MnO 0.088 % TiO ₂ 0.01 % BaO 1.40 % Na ₂ O 5.70 % ZrO ₂ 0.005 % CaO 0.21 % P ₂ O ₅ 0.23 % LOI* 0.32 %	45 g

Code	Product	Unit
NIST-92	Low boron soda-lime powder - Boron Certified value B ₂ O ₃ 0.70 % Indicative values for CaO, K ₂ O, MgO, Na ₂ O, SiO ₂ , ZnO, LOI*	45 g
NIST-93a	Borosilicate glass - Constituents 32 x 6 mm wafer Certified values Cl 0.060 % Fe ₂ O ₃ 0.028 % Na ₂ O 3.98 % Al ₂ O ₃ 2.28 % FeO 0.016 % SiO ₂ 80.8 % B ₂ O ₃ 12.56 % K ₂ O 0.014 % TiO ₂ 0.014 % CaO 0.01 % MgO 0.005 % ZrO ₂ 0.042 %	unit
NIST-1411	Soft borosilicate glass - Constituents Set of 10 platelets (32 x 32 x 3 mm) Certified values Al ₂ O ₃ 5.68 % Fe ₂ O ₃ 0.050 % SiO ₂ 58.04 % B ₂ O ₃ 10.94 % K ₂ O 2.97 % SrO 0.09 % BaO 5.00 % MgO 0.33 % TiO ₂ 0.02 % CaO 2.18 % Na ₂ O 10.14 % ZnO 3.85 %	set (10)
NCS DC61104	Borosilicate glass - Constituents Certified values F 0.54 % Fe ₂ O ₃ 0.34 % SiO ₂ 53.98 % Al ₂ O ₃ 14.50 % K ₂ O 0.59 % TiO ₂ 0.19 % B ₂ O ₃ 8.87 % MgO 4.40 % LOI* 0.26 % CaO 16.54 % Na ₂ O 0.096 %	50 g
NIST-81a	Glass sand - Constituents Certified values Al ₂ O ₃ 0.66 % Fe ₂ O ₃ 0.082 % ZrO ₂ 0.034 % Cr ₂ O ₃ 46 mg/kg TiO ₂ 0.12 %	75 g
NIST-165a	Glass sand (low iron) - Constituents Certified values Al ₂ O ₃ 0.059 % TiO ₂ 0.011 % Fe ₂ O ₃ 0.012 % ZrO ₂ 0.006 %	75 g
NIST-1413	Glass sand (high alumina) - Constituents Certified values Al ₂ O ₃ 9.90 % Fe ₂ O ₃ 0.24 % Na ₂ O 1.75 % BaO 0.12 % K ₂ O 3.94 % SiO ₂ 82.77 % CaO 0.74 % MgO 0.06 % TiO ₂ 0.11 %	75 g
New SGTSAND6	Standard sand 6 - Constituents Certified values Al ₂ O ₃ 0.60 % K ₂ O 0.40 % SiO ₂ 98.66 % CaO < 0.02 % MgO < 0.02 % TiO ₂ 0.024 % Fe ₂ O ₃ (total Fe) 0.032 % Na ₂ O < 0.02 % LOI* 0.14 % *Loss on ignition	200 g
New SGTSAND8	Standard sand 8 - Constituents Certified values Al ₂ O ₃ 2.07 % K ₂ O < 1.06 % SiO ₂ 95.63 % CaO 0.06 % MgO 0.12 % TiO ₂ 0.073 % Fe ₂ O ₃ (total Fe) 0.26 % Na ₂ O 0.20 % LOI* 0.48 % *Loss on ignition	200 g
NIST-620	Soda-lime flat glass - Constituents Set of 3 platelets (35 x 35 x 3 mm) Certified values Al ₂ O ₃ 1.80 % K ₂ O 0.41 % SO ₃ 0.28 % As ₂ O ₃ 0.056 % MgO 3.69 % TiO ₂ 0.018 % CaO 7.11 % Na ₂ O 14.39 % Fe ₂ O ₃ 0.043 % SiO ₂ 72.08 %	set (3)
NIST-621	Soda-lime container glass - Constituents Set of 3 discs (38 x 5 mm) Certified values Al ₂ O ₃ 2.76 % Fe ₂ O ₃ 0.040 % SO ₃ 0.13 % As ₂ O ₃ 0.030 % K ₂ O 2.01 % SiO ₂ 71.13 % BaO 0.12 % Na ₂ O 12.74 % TiO ₂ 0.014 % CaO 10.71 % MgO 0.27 % ZrO ₂ 0.007 %	set (3)

Glass and ceramics

Code	Product	Unit
NIST-1830	Soda-lime float glass - Constituents Set of 3 platelets (38 x 38 x 6 mm) Certified values Al ₂ O ₃ 0.12 % K ₂ O 0.04 % SO ₃ 0.26 % CaO 8.56 % MgO 3.90 % TiO ₂ 0.011 % FeO 0.032 % Na ₂ O 13.75 % Fe ₂ O ₃ 0.121 % SiO ₂ 73.07 %	3 platelets
NIST-1831	Soda lime sheet glass - Constituents Set of 3 platelets (37 x 37 x 3 mm) Certified values Al ₂ O ₃ 1.21 % K ₂ O 0.33 % SO ₃ 0.25 % CaO 8.20 % MgO 3.51 % TiO ₂ 0.019 % FeO 0.025 % Na ₂ O 13.32 % Fe ₂ O ₃ 0.087 % SiO ₂ 73.08 %	3 platelets
NIST-1834	Fused ore glass - Constituents 30 x 3 mm disc Certified values Al 20.71 % K 0.42 % Sr 0.153 % Ba 0.062 % Mg 0.088 % Ti 1.11 % Ca 0.0955 % P 0.152 % Fe 0.32 % Si 20.19 % Indicative values for B, Cr, Li, Na, Zr	disc
New SGTGLASS4-D	Fluoride opal glass - Constituents Reference: Glass Technol., 1962, 3 (1), 9-16, 'the chemical analysis of a fluoride glass described as Standard Glass No. 4'. Certified values F 4.96 % K ₂ O 0.57 % TiO ₂ 0.041 % Al ₂ O ₃ 3.02 % MgO <0.05 % ZnO 3.28 % B ₂ O ₃ 0.19 % Na ₂ O 15.45 % Loss at 550 °C 0.22 % CaO 4.24 % SO ₃ (total S) <0.05 % Fe ₂ O ₃ (total Fe) 0.099 % SiO ₂ 69.49 %	disc
New SGTGLASS4-P	Fluoride opal glass - Constituents Glass pieces	25 g
New SGTGLASS6-P	Soda-lime-silica glass - Constituents Certified values Al ₂ O ₃ 1.70 % K ₂ O <0.1 % SO ₃ (total S) 0.20 % CaO 9.97 % MgO <0.1 % SiO ₂ 73.06 % Fe ₂ O ₃ (total Fe) 0.034 % Na ₂ O 14.65 % TiO ₂ 0.02 %	25 g
New SGTGLASS7-D	Soda - lime - silica glass - Constituents Certified values Al ₂ O ₃ 1.50 % Na ₂ O 13.90 % TiO ₂ 0.042 % CaO 11.03 % MgO 0.14 % Loss at 550 °C 0.07 % Fe ₂ O ₃ (total Fe) 0.044 % SO ₃ (total S) 0.19 % K ₂ O 0.43 % SiO ₂ 72.64 %	disc
New SGTGLASS7-P	Soda - lime - silica glass - Constituents Glass pieces	25 g
New SGTGLASS8-P	Lead oxide - potassium oxide - silica glass - Constituents Certified values Al ₂ O ₃ 0.05 % Fe ₂ O ₃ (total Fe) 0.010 % PbO 30.59 % As ₂ O ₃ (total As) 0.32 % K ₂ O 11.85 % SiO ₂ 56.34 % B ₂ O ₃ 0.36 % MgO <0.02 % TiO ₂ 0.02 % CaO <0.02 % Na ₂ O 0.23 % Loss at 550 °C 0.21 %	25 g
New SGTGLASS10-D	Amber soda - lime - silica container glass - Constituents 40 mm diameter disc Certified values Al ₂ O ₃ 1.62 % K ₂ O 0.35 % SO ₃ 0.05 % BaO 0.02 % MgO 1.81 % TiO ₂ 0.097 % CaO 10.7 % Na ₂ O 12.2 % Cr ₃ O ₃ 0.020 % Fe ₂ O ₃ 0.325 % SiO ₂ 72.7 %	disc
New SGTGLASS10-P	Amber soda - lime - silica container glass - Constituents Glass pieces	25 g
New SGTGLASS11-D	Green soda - lime - silica container glass - Constituents 40 mm diameter disc Certified values Al ₂ O ₃ 1.83 % K ₂ O 0.69 % SO ₃ 0.06 % BaO 0.03 % MgO 2.14 % TiO ₂ 0.068 % CaO 10.3 % Na ₂ O 13.6 % Cr ₂ O ₃ 0.205 % Fe ₂ O ₃ 0.342 % SiO ₂ 70.7 %	disc

Code	Product	Unit
New SGTGLASS11-P	Green soda - lime- silica container glass - Constituents Glass pieces	25 g
NIST-607	Potassium feldspar - Trace elements Certified values Rb 523.90 mg/kg Sr 65.485 mg/kg	5 g
NIST-610	NIST-610 and NIST-611 NIST-610 and NIST-611 are the same material and therefore have the same certified values. NIST-610 consists of glass 3 mm thick and NIST-611 is 1 mm thick. Glass - Trace elements Certified values Fe 458 mg/kg Pb 426 mg/kg Th 457.2 mg/kg Mn 485 mg/kg Rb 425.7 mg/kg U 461.5 mg/kg Ni 458.7 mg/kg Sr 515.5 mg/kg Indicative values for Ag, Au, Co, Cu, K, Ti, Tl, Zn	6 wafers
NIST-611	Glass - Trace elements	6 wafers
NIST-612	NIST-612 and NIST-613 NIST-612 and NIST-613 are the same material and therefore have the same certified values. NIST-612 consists of glass 3 mm thick and NIST-613 is 1 mm thick. Glass - Trace elements Certified value Ag 22.0 mg/kg Pb 38.57 mg/kg Th 37.9 mg/kg Fe 51 mg/kg Rb 31.4 mg/kg U 37.38 mg/kg Ni 38.8 mg/kg Sr 78.4 mg/kg Indicative values for Au, B, Ba, Ce, Co, Cu, Dy, Er, Eu, Gd, K, La, Mn, Nd, Sm, Ti, Tl, Zn	6 wafers
NIST-613	Glass - Trace elements	6 wafers
NIST-614	NIST-614 and NIST-615 NIST-614 and NIST-615 are the same material and therefore have the same certified values. NIST-614 consists of wafers of glass 3 mm thick and NIST-615 is 1 mm thick. Glass - Trace elements Certified values Ag 0.42 mg/kg Pb 2.32 mg/kg Th 0.748 mg/kg Cu 1.37 mg/kg Rb 0.855 mg/kg U 0.823 mg/kg K 30 mg/kg Sr 78.4 mg/kg Indicative values for Au, B, Cd, Co, Eu, Fe, Ga, La, Ni, Sb, Sc, Ti, Tl	6 wafers
NIST-615	Glass - Trace elements	6 wafers
NIST-616	NIST-616 and NIST-617 NIST-616 and NIST-617 are the same material and therefore have the same certified values. NIST-616 consists of wafers of glass 3 mm thick and NIST-617 is 1 mm thick. Glass - Trace elements Certified values K 29 mg/kg Sr 41.72 mg/kg U 0.0721 mg/kg Pb 1.85 mg/kg Th 0.0252 mg/kg Indicative values for Au, B, Cu, Fe, Ga, La, Rb, Sb, Sc, Ti, Tl	6 wafers
NIST-617	Glass - Trace elements	6 wafers
NIST-1872	Synthetic glass - Lead and germanium NIST-1872 consists of three different lead-germanate glasses in rod form approximately 2 x 2 x 20 mm. <u>K-453</u> Certified values Ge 28.43 % Pb 54.21 % Indicative value for O <u>K-491</u> Certified values Ge 26.10 % Pb 54.69 % Indicative values for Al, Ce, Fe, O, Si, Ta, Ti, Zr <u>K-968</u> Certified values Ge 25.93 % Pb 54.74 % Indicative values for Ba, Cr, Eu, Mg, Ni, O, P, Si, Th, Ti, U, Zr	set (3)

Plastics

Code	Product	Unit
NIST-2066	<p>K-411 glass microspheres</p> <p>This Standard Reference Material (SRM[®]) is intended for use as a standard for the quantitative microanalysis of particles and for the development of particle matrix correction procedures. The elements present in these microspheres, common to many classes of particles, are silicon, calcium, magnesium, iron, and oxygen. NIST-2066 consists of approximately 50 mg of glass microspheres of known composition and size (1 µm to 40 µm) with minimal microheterogeneity.</p> <p>Certified concentration in mass fraction of microspheres larger than 2 µm</p> <p>Silicon 0.256 ± 0.017 kg/kg Magnesium 0.092 ± 0.014 kg/kg Calcium 0.112 ± 0.023 kg/kg Iron 0.112 ± 0.023 kg/kg</p> <p>Indicative value for oxygen kg/kg</p>	50 mg

Plastics

Code	Product	Unit
	<p>The "Packaging-Directive" – EC-Directive 94/62/EEC – regulates the amount of metals such as Cd, Cr, Hg and Pb in plastics. The materials VDA 001-4 as well as ERM-EC680 and ERM-EC681 were produced to facilitate the implementation of this directive and to allow the effective introduction of QA-systems for elemental analysis of plastic materials.</p>	
VDA 001-4	<p>Polyethylene - Cadmium</p> <p>Four polyethylene reference materials have been certified by IRMM on behalf of Verband der Automobilindustrie e.V. (VDA).</p> <p>Certified values</p> <p><u>Sicolen Yellow 09/16493</u> Cd 40.9 ± 1.2 mg/kg</p> <p><u>Sicolen Orange 28/16494</u> Cd 75.9 ± 2.1 mg/kg</p> <p><u>Sicolen Red 39/16495</u> Cd 198 ± 5 mg/kg</p> <p><u>Sicolen Bordeaux 49/16496</u> Cd 407 ± 12 mg/kg</p>	4 bottles
ERM-EC680K	<p>Polyethylene - Trace elements (low level)</p> <p>Certified values</p> <p>As 4.1 mg/kg Cl 102.2 mg/kg Pb 13.6 mg/kg Br 96 mg/kg Cr 20.2 mg/kg S 76 mg/kg Cd 19.6 mg/kg Hg 4.64 mg/kg Sb 10.1 mg/kg</p>	100 g
ERM-EC681K	<p>Polyethylene - Trace elements (high level)</p> <p>Certified values</p> <p>As 29.1 mg/kg Cl 0.8 g/kg Pb 98 mg/kg Br 0.77 g/kg Cr 100 mg/kg S 0.63 g/kg Cd 137 mg/kg Hg 23.7 mg/kg Sb 99 mg/kg</p>	100 g
New NIST-2855	<p>Polyethylene - Additive elements</p> <p>This Standard Reference Material (SRM) is intended for the calibration or evaluation of methods for elemental analysis of polymers. A unit of SRM 2855 consists of one bottle of Level I low-density polyethylene, one bottle of Level II high-density polyethylene, and one bottle of Level III high-density polyethylene. Each bottle contains approximately 80 g of material in pellet form.</p> <p>Certified values for NIST-2855 Level II and Level III</p> <p>Level II</p> <p>Na 16.0 ± 1.5mg/kg Ca 37.6 ± 5.1mg/kg Zn 415 ± 20mg/kg P 22.0 ± 1.5mg/kg Ti 10.4 ± 0.3mg/kg S 21.0 ± 1.4mg/kg Cr 2.4 ± 0.5mg/kg</p> <p>Level III</p> <p>Na 16.4 ± 1.3mg/kg Ca 77.2 ± 2.4mg/kg Zn 807 ± 15mg/kg P 41.6 ± 2.9mg/kg Ti 10.4 ± 0.3mg/kg S 41.2 ± 3.1mg/kg Cr 2.4 ± 0.5mg/kg</p> <p>Indicative values for Level I: Na, Si, P, S, Ca, Ti, Cr, Zn, Br, Cd, Hg and Pb Indicative values for Level II and Level III: Br, Cd, Hg and Pb</p>	300 mg
FLX-PVC-SET	<p>PVC - Trace elements</p> <p>Set of 3 samples. Milled powder and granules up to 5 mm diameter.</p> <p>Certified values</p> <p>FLX-PVC1</p> <p>Pb 8 ± 2 mg/kg Cd <1mg/kg</p> <p>FLX-PVC2</p> <p>Pb 89 ± 6 mg/kg Cd 35 ± 3 mg/kg</p> <p>FLX-PVC3</p> <p>Pb 837 ± 52 mg/kg Cd 85 ± 6 mg/kg</p> <p>Indicative values for Ca and Zn</p>	3 x 21 g

Code	Product	Unit																								
BCR-712	PET bottle material - Chemical inertness Refillable PET bottle material with respect to chemical inertness behaviour according to a pr-CEN standard method.	tin can																								
	<table border="1"> <thead> <tr> <th>Compound</th> <th>Certified value in mg/dm²</th> <th>Uncertainty in mg/dm²</th> </tr> </thead> <tbody> <tr> <td>Toluene.....</td> <td>7.3</td> <td>0.6</td> </tr> <tr> <td>Phenol.....</td> <td>4.1</td> <td>0.5</td> </tr> <tr> <td>Limonene.....</td> <td>3.9</td> <td>0.5</td> </tr> <tr> <td>Menthol.....</td> <td>1.78</td> <td>0.18</td> </tr> <tr> <td>Phenylcyclohexane.....</td> <td>3.5</td> <td>0.4</td> </tr> <tr> <td>Benzophenone.....</td> <td>5.6</td> <td>0.6</td> </tr> </tbody> </table>	Compound	Certified value in mg/dm ²	Uncertainty in mg/dm ²	Toluene.....	7.3	0.6	Phenol.....	4.1	0.5	Limonene.....	3.9	0.5	Menthol.....	1.78	0.18	Phenylcyclohexane.....	3.5	0.4	Benzophenone.....	5.6	0.6				
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New ERM-EC590	Polyethylene - Polybrominated biphenylether and biphenyls Certified values	20 g																								
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New ERM-EC591	Polypropylene - Polybrominated biphenylether and biphenyls Certified values	20 g																								
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New NCS RC76001	Polypropylene - Pb, Hg, Cr, Cd (for X-ray Fluorescence (XRF) analysis) Each set include one blank and two different content level. The minimum package is 30 grams.	set																								
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NMIJ CRM 8102-A	ABS resin - Cd, Cr, Pb (low concentration) - pellets Certified values	25 g																								
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NMIJ CRM 8103-A	ABS resin - Cd, Cr, Pb (high concentration) - pellets Certified values	25 g																								
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NMIJ CRM 8112-A	ABS resin - Cd, Cr, Hg, Pb (low concentration) - pellets Certified values	25 g																								
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Plastics

Code	Product	Unit
NMIJ CRM 8113-A	ABS resin - Cd, Cr, Hg, Pb (high concentration) - pellets Certified values Cd 93.93 mg/kg Hg.....941.5 mg/kg Cr 943.6 mg/kg Pb.....945.0 mg/kg	25 g
NMIJ CRM 8115-A	ABS resin - Cd, Cr, Hg, Pb (low concentration) - disc (30 mm x 2 mm) Certified values Cd 9.341 mg/kg Hg.....93.81 mg/kg Cr 94.27 mg/kg Pb.....94.21 mg/kg	disc
NMIJ CRM 8116-A	ABS resin - Cd, Cr, Hg, Pb (high concentration) - disc (30 mm x 2 mm) Certified values Cd 93.67 mg/kg Hg.....938.7 mg/kg Cr 943.7 mg/kg Pb.....940.6 mg/kg	disc
New JSAC 0601-3	Plastics (polyester) - Pb, Cd, Cr, Hg Certified values Cd 5.0 µg/g Hg.....1.31 µg/g Cr 11.3 µg/g Pb.....12.2 µg/g	50 g
New JSAC 0602-3	Plastics (polyester) - Pb, Cd, Cr, Hg Certified values Cd 50.6 mg/kg Hg.....12.1 mg/kg Cr 112.5 mg/kg Pb.....112.1 mg/kg	50 g
JSAC 0611-15	Plastics (polyester) for fluorescent X-ray Analysis - Pb, Cd, Cr (40 mm x 4 mm) Set of discs Certified values JSAC 0611 (for blank analysis) Pb < 1 mg/kg Cd.....< 1 mg/kg Cr < 1 mg/kg JSAC 0612 Pb 26.1 mg/kg Cd.....4.5 mg/kg Cr 25.5 mg/kg JSAC 0613 Pb 54.6 mg/kg Cd.....10.0 mg/kg Cr 52.0 mg/kg JSAC 0614 Pb 106.8 mg/kg Cd.....23.8 mg/kg Cr 98.6 mg/kg JSAC 0615 Pb 202.2 mg/kg Cd.....43.4 mg/kg Cr 212.8 mg/kg	set
JSAC 0621-25	Plastics (polyester) for fluorescent X-ray analysis - Mercury (40 mm x 4 mm) Set of discs Certified values JSAC 0621(for blank test) JSAC 0622 Hg 10.0 mg/kg JSAC 0623 Hg 49.0 mg/kg JSAC 0624 Hg 121.1 mg/kg JSAC 0625 Hg 244.4 mg/kg	set
JSAC 0631-32	Plastics (polyester) for fluorescent X-ray analysis - Pb, Cd, Cr, Hg (40 mm x 4 mm) Set of discs Certified values JSAC 0631 Pb 24.5 mg/kg Cr.....25.8 mg/kg Cd 22.5 mg/kg Hg.....19.7 mg/kg JSAC 0632 Pb 92.9 mg/kg Cr.....93.3 mg/kg Cd 46.1 mg/kg Hg.....59.4 mg/kg	set

Code	Product	Unit																																																								
JSAC 0651-55	Plastics (polyester) for fluorescent X-ray analysis - Bromine (40 mm x 4 mm) Set of discs Certified values JSAC 0651(for blank test) Br < 1 mg/kg (reference value) JSAC 0652 Br 105.8 mg/kg JSAC 0653 Br 292.6 mg/kg JSAC 0654 Br 595 mg/kg JSAC 0655 Br 993 mg/kg	set																																																								
JSM P 700-1	Plastic (polyethylene) - Trace elements Certified values Cd 5 µg/g Cr 4.9 µg/g Cl (0.004) % Pb 5 µg/g As 9.1 µg/g S (0.006) % Hg 5.3 µg/g Br (0.002) % Values in parenthesis are non certified	50 g																																																								
JSM P 701-1	Plastic (polyethylene) - Trace elements Certified values Cd 113.5 µg/g Cr 114.8 µg/g Cl (0.06) % Pb 111.3 µg/g As 187.3 µg/g S (0.04) % Hg 111.6 µg/g Br (0.05) % Values in parenthesis are non certified	50 g																																																								
JSM P 710-1	Plastic (polyethylene) - Trace elements (30 mm x 30 mm x 3 mm) Certified values <table border="1"> <thead> <tr> <th>Item no.</th> <th>Cd µg/g</th> <th>Pb µg/g</th> <th>Hg µg/g</th> <th>Cr µg/g</th> <th>As µg/g</th> <th>Br %</th> </tr> </thead> <tbody> <tr> <td>a.....</td> <td><1</td> <td><1</td> <td><1</td> <td><1</td> <td><1</td> <td>(<0.001)</td> </tr> <tr> <td>b.....</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>9</td> <td>(0.0029)</td> </tr> <tr> <td>c.....</td> <td>50</td> <td>50</td> <td>51</td> <td>52</td> <td>86</td> <td>(0.035)</td> </tr> <tr> <td>d.....</td> <td>114</td> <td>111</td> <td>112</td> <td>115</td> <td>187</td> <td>(0.05)</td> </tr> <tr> <td>e.....</td> <td>264</td> <td>270</td> <td>254</td> <td>265</td> <td>478</td> <td>(0.15)</td> </tr> <tr> <td>f.....</td> <td>522</td> <td>532</td> <td>546</td> <td>515</td> <td>907</td> <td>(0.27)</td> </tr> <tr> <td>g.....</td> <td>1.11x10³</td> <td>1.12x10³</td> <td>1.09x10³</td> <td>1.10x10³</td> <td>1.95x10³</td> <td>(0.62)</td> </tr> </tbody> </table> Values in parenthesis are non certified	Item no.	Cd µg/g	Pb µg/g	Hg µg/g	Cr µg/g	As µg/g	Br %	a.....	<1	<1	<1	<1	<1	(<0.001)	b.....	5	5	5	5	9	(0.0029)	c.....	50	50	51	52	86	(0.035)	d.....	114	111	112	115	187	(0.05)	e.....	264	270	254	265	478	(0.15)	f.....	522	532	546	515	907	(0.27)	g.....	1.11x10 ³	1.12x10 ³	1.09x10 ³	1.10x10 ³	1.95x10 ³	(0.62)	set (7)
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New NMIJ CRM 8108-B	Polybrominated diphenyl ethers in polystyrene - disc (30 mm x 2 mm) Certified values Decabromodiphenyl ether (BDE-209).....312 ± 16 mg/kg	5 discs																																																								
New BAM-H010	Acrylonitrile-Butadiene-Styrene-Copolymerisate (ABS) - Pb, Br, Cd, Cr (granulate) Granular material Certified values Lead (Pb)..... 479 ± 17 µg/g Cadmium (Cd).....93 ± 5 µg/g Bromine (Br) 240 ± 21 µg/g Chromium (Cr)470 ±36 µg/g Indicative value for Mercury (Hg)	100 g																																																								
New BAM-H010-D1	Acrylonitrile-Butadiene-Styrene-Copolymerisate (ABS) - Pb, Br, Cd, Cr (disc 40 mm x 1 mm)	disc																																																								
New BAM-H010-D2	Acrylonitrile-Butadiene-Styrene-Copolymerisate (ABS) - Pb, Br, Cd, Cr (disc 40 mm x 2 mm)	disc																																																								
New BAM-H010-D3	Acrylonitrile-Butadiene-Styrene-Copolymerisate (ABS) - Pb, Br, Cd, Cr (disc 40 mm x 6 mm)	disc																																																								
New BAM-H010-D1-D2-D3	Acrylonitrile-Butadiene-Styrene-Copolymerisate (ABS) - Pb, Br, Cd, Cr (set of discs) Set of disc 40 mm x 1 mm (BAM-H010-D) disc 40 mm x 2 mm (BAM-H010-D2) disc 40 mm x 6 mm (BAM-H010-D3)	set of discs																																																								

Paint and industrial sludges

Code	Product	Unit
NIST-2579a	Set of six lead paint films (NIST-2570 - NIST-2575) - Lead A unit of NIST-2579a consists of a set of six coated polyester sheets, approximately 7.6 cm wide and 10.2 cm long. Five of the six sheets, NIST-2571 to NIST-2575, are coated with a single, uniform paint layer. The units are color coded and each color indicates a different level of lead content. The paint layer and white polyester sheet are approximately 0.04 mm and 0.2 mm thick, respectively. The sixth sheet, NIST-2570, is coated with a lead-free, lacquer layer of the same thickness as the lead paint samples and is included as a blank. All sheets are over-coated with a clear, thin, plastic laminate to protect the surface from abrasion.	set (6)
	NIST-2570 - NIST-2576 These items consist of one Mylarä sheet per unit. Each sheet, 7.6 cm x 10.2 cm, is coated with a single uniform paint layer for use with portable x-ray fluorescence analysers.	
NIST-2570	Lead paint film (white/blank) - Lead Certified value Pb <0.01 mg/cm ²	2 sheets
NIST-2571	Lead paint film (yellow) - Lead A unit of NIST-2571 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, yellow-colored paint layer, approximately 0.04 mm thick. A blank, SRM 2570, is also provided. Certified value Pb 3.58 mg/cm ²	2 sheets
NIST-2572	Lead paint film (orange) - Lead A unit of NIST-2572 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, orange-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb 1.527 mg/cm ²	2 sheets
NIST-2573	Lead paint film (red) - Lead A unit of NIST-2573 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, red-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb 1.040 mg/cm ²	2 sheets
NIST-2574	Lead paint film (gold) - Lead A unit of NIST-2574 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, gold-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb 0.714 mg/cm ²	2 sheets
NIST-2575	Lead paint film (green) - Lead A unit of NIST-2575 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, green-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb 0.307 mg/cm ²	2 sheets
NIST-2576	Lead paint film (blue) - Lead A unit of NIST-2576 consists of a white polyester sheet, approximately 7.6 cm wide, 10.2 cm long, and 0.2 mm thick, coated with a single, blue-colored paint layer, approximately 0.04 mm thick. A blank, NIST-2570, is also provided. Certified value Pb 5.59 mg/cm ²	2 sheets
NIST-2589	Powdered paint - Lead NIST-2589 is composed of paint collected from the interior surface of housing. Certified value Pb 9.99 % ± 1.6 %	35 g
NIST-2580	Powdered paint - Lead Certified value Pb 4.34 %	30 g
NIST-2581	Powdered paint - Lead Certified value Pb 0.449 %	35 g
NIST-2582	Powdered paint - Lead Certified value Pb 209 mg/kg	20 g

Paint and industrial sludges

Code	Product	Unit
NIST-RM 8680	Paint on fiberboard - Lead 10.2 x 15.2 x 1.3 cm sheet Indicative value for Pb	sheet
RTC-CRM017-020	Powdered paint - Lead The value was determined by USEPA SW-846 Methods 3050, 3051, 6010, and 7420 and NIOSH 7082. The sample is traceable to NIST by analysis, and is suitable for use by these and other similar methods. Certified value Pb 7418 mg/kg	20 g
RTC-CRM050-020	Black powder paint - Lead Certified value Pb <0.01 mg/kg	20 g
RTC-CRM013-050	Paint chips/waste - Trace elements The values were determined by USEPA SW846 (3rd edition) Methods 3050 and 6010. The sample is suitable for other 3000-series metals digestion procedure and 7000-series spectroscopic methods. Certified values Cd 38 mg/kg Cr 618 mg/kg Pb 643 mg/kg	50 g
RTC-CRM006-050	Paint sludge - Trace elements Certified values Al 73 mg/kg Cr 11 mg/kg Na 91 mg/kg Ba 9970 mg/kg Fe 64 mg/kg Pb 753 mg/kg Ca 111 mg/kg K 8710 mg/kg Zn 737431 mg/kg Cd 32 mg/kg Mg 47 mg/kg Indicative values for B, Cu, Mn, Ni, Se, Sn, Sr, Ti, Tl	50 g
NIST-2586	Soil containing lead from paint - Trace elements Soil collected from urban areas where the principal source of lead is believed to be from old lead-based house paint. Certified values As 8.7 mg/kg Cr 301 mg/kg Cd 2.71 mg/kg Pb 432 mg/kg Indicative values for a wide range of additional elements	55 g
NIST-2587	Soil containing lead from paint - Trace elements Soil collected from a suburban garden known to have been contaminated by lead-based house paint. Certified values As 13.7 mg/kg Cr 92 mg/kg Cd 1.92 mg/kg Pb 3242 mg/kg Indicative values for a wide range of additional elements	55 g
RTC-CRM009-100	Electroplating sludge no. 1 - Trace metals The Reference Values were determined by USEPA SW846 (3rd edition) Methods 3050 and 6010. The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods. Reference values Ag 8.9 mg/kg Cu 121000 mg/kg Cr 50.3 mg/kg Ni 343 mg/kg	100 g
RTC-CRM010-100	Electroplating sludge no. 2 - Trace metals The values were determined by USEPA SW846 (3rd edition) Methods 3050 and 6010, except for Mercury (Method 7471). The sample is suitable for other 3000-series metals digestion procedures and 7000-series spectroscopic methods. Certified values Ag 56 mg/kg Cr 79 mg/kg Mn 17 mg/kg Al 692 mg/kg Cu 63169 mg/kg Ni 194 mg/kg Ba 175 mg/kg Fe 2,699 mg/kg Zn 183 mg/kg Ca 563 mg/kg Pb 119344 mg/kg Indicative values for Hg, Mg, Mo, Na	100 g
RTC-CRM011-100	Electroplating sludge no. 3 - Trace metals Certified values Cr 59225 mg/kg Ni 41975 mg/kg Cu 108 mg/kg Pb 269 mg/kg Indicative values for a further 21 elements	100 g
RTC-CRM101-100	API separator sludge - PAHs Polynuclear aromatic hydrocarbons (PAH) contaminated oily sludge from a refinery located in the Western United States. The values were determined by USEPA SW846 (3rd edition) Methods 3540, 3550 and 8270. Sample is suitable for use by these and other similar methods. Certified values Chrysene 10.6 mg/kg Phenanthrene 169 mg/kg 2-Methylnaphthalene 250 mg/kg Phenol (30.09) mg/kg Fluorene 68.4 mg/kg Pyrene 17 mg/kg Naphthalene 89.5 mg/kg	100 g

Standards for the semiconductor industry

Code	Product	Unit
NIST-2841	Semiconductor thin film Al mole fraction x near 0.20 This Standard Reference Material (SRM [®]) is intended for use as a reference standard for analytical methods that measure the composition of thin films, such as electron microprobe analysis (EMPA), photoluminescence (PL), auger electron spectroscopy (AES) and X-ray photoelectron spectroscopy (XPS). A unit of NIST-2841 consists of an epitaxial layer of Al _x Ga _{1-x} As with certified Al mole fraction x grown on a GaAs substrate mounted to a stainless steel disc by the use of adhesive tape. Each unit is sealed in a Mylar envelope containing a nitrogen atmosphere.	disc
NIST-1994	Standard silicon single crystal wafer for crystalline orientation This Standard Reference Material (SRM [®]) is intended for use in the calibration of instruments (X-ray diffractometers) used to measure the crystal orientation of wafers relative to the crystal surface. The SRM unit consists of a 100-mm diameter silicon wafer. The crystal orientation of the (001) silicon crystal planes relative to the surface normal has been measured both parallel and perpendicular to an edge flat that is manufactured into the wafer.	unit
New NIST-1995	Standard sapphire single crystal wafer for crystalline orientation This Standard Reference Material [®] (SRM [®]) is intended for use in the calibration of instruments (X-ray diffractometers) used to measure the crystal orientation of wafers relative to the crystal surface. NIST-1995 consists of a 50 mm diameter sapphire wafer. Certified values for crystal orientation. Please ask for details.	50-mm wafer

High tech ceramics

Code	Product	Unit
NIST-2842	Semiconductor thin film: Al _x Ga _{1-x} As epitaxial layers Al mole fraction x near 0.30 This Standard Reference Material (SRM [®]) is intended for use as a reference standard for analytical methods that measure the composition of thin films, such as electron microprobe analysis (EMPA), photoluminescence (PL), auger electron spectroscopy (AES) and X-ray photoelectron spectroscopy (XPS). A unit of NIST-2842 consists of an epitaxial layer of Al _x Ga _{1-x} As with certified Al mole fraction x grown on a GaAs substrate mounted to a stainless steel disc by the use of adhesive tape. Each unit is sealed in a Mylar envelope containing a nitrogen atmosphere.	disc
ERM-ED101	Silicon nitride powder (BAM-S001) Certified values Al..... 469 ± 12 mg/kg Mg 4.3 ± 0.4 mg/kg N 38.1 ± 0.2 % Ca 14.1 ± 0.5 mg/kg Na 7.59 ± 0.27 mg/kg O (1.91 ± 0.07) % Co 43.5 ± 0.8 mg/kg W 41.3 ± 1.3 mg/kg β-phase 7.43 ± 0.09 % Fe 79.5 ± 1.3 mg/kg C 0.162 ± 0.024 % (Values in parenthesis are indicative values)	50 g
BAM-S003	Silicon carbide powder Certified values Al 372 ± 20 mg/kg Mn 1.44 ± 0.17 mg/kg O 910 ± 35 mg/kg B 63 ± 7 mg/kg Na 17.7 ± 0.8 mg/kg N (93 ± 22) mg/kg Ca 29.4 ± 1.8 mg/kg Ni 32.9 ± 2.7 mg/kg SiO _{2 free} (600 ± 148) mg/kg Cr 3.5 ± 0.4 mg/kg Ti 79 ± 4 mg/kg Si _{free} (481 ± 223) mg/kg Cu 1.5 ± 0.4 mg/kg V 41.4 ± 2.8 mg/kg C _{total} 29.89 ± 0.07 % Fe 149 ± 10 mg/kg Zr 25.2 ± 2.0 mg/kg Mg 6.3 ± 0.6 mg/kg C _{free} 493 ± 79 mg/kg (Values in parenthesis are indicative values)	bottle
NIST-154c	Titanium dioxide - Purity This Standard Reference Material [®] (SRM [®]) is intended primarily for use in the evaluation of techniques employed in the assay of titanium dioxide in the paint and ceramic industries. Certified value Titanium dioxide 99.951 % Informational values for impurities	90 g
BAS-BCS-CRM 201A	Nepheline Syenite SiO ₂ (57.3) % MgO (0.025) % Mn ₂ O ₃ (0.007) % Al ₂ O ₃ (23.54) % Na ₂ O (7.53) % SrO (0.43) % TiO ₂ (0.05) % K ₂ O (8.9) % L.O.I. (0.76) % Fe ₂ O ₃ (0.12) % P ₂ O ₅ (0.025) % CaO (1.07) % BaO (0.37) % (Values in parenthesis are indicative values)	100 g
BAS-BCS-CRM 202A	Plaster (Gypsum) SiO ₂ (1.38) % CaO (37.4) % P ₂ O ₅ (<0.01) % Al ₂ O ₃ (0.33) % MgO (0.39) % SrO (0.33) % TiO ₂ (0.03) % Na ₂ O (<0.03) % SO ₃ (53) % Fe ₂ O ₃ (0.1) % K ₂ O (0.1) % (Values in parenthesis are indicative values)	100 g

Code	Product	Unit
BAS-BCS-CRM 203A	Talc SiO ₂(59.7) % CaO (0.25) % P ₂ O ₅ (0.13) % Al ₂ O ₃(0.3) % MgO (32.08) % L.O.I.(6.78) % TiO ₂(<0.01) % Na ₂ O (0.02) % Fe ₂ O ₃(0.22) % K ₂ O (0.005) % (Values in parenthesis are indicative values)	100 g
BAS-BCS-CRM 204A	Zircon SiO ₂(37,6) % CaO (0.15) % P ₂ O ₅(0.77) % Al ₂ O ₃(0.74) % MgO (0.012) % SnO ₂(1.69) % TiO ₂(2.22) % Na ₂ O (0.014) % ZrO ₂ +HfO ₂(53.8) % Fe ₂ O ₃(0.18) % K ₂ O (0.017) % L.O.I.(0.5) % (Values in parenthesis are indicative values)	100 g

Miscellaneous

Code	Product	Unit
NIST-2556	Used auto catalyst - recycled pellet Certified values Pb 6228 mg/kg Pt 697.4 mg/kg Pd 326.0 mg/kg Rh 51.2 mg/kg	70 g
NIST-2557	Used auto catalyst - recycled monolith Certified values Pb 1131 mg/kg Pt 1131 mg/kg Pd 233.2 mg/kg Rh 135.1 mg/kg	70 g
NIST-RM 8495	Northern softwood bleached kraft pulp - Properties (RM) Properties of fibres and paper sheets	10 sheets
New ERM-EB503	Pt, and Pd in unused automobile catalyst - powder Certified values Pt 1880 ± 30 mg/kg Pd 2780 ± 80 mg/kg Indicative value for Rh	100 g
ERM-EB504	Pt, Pd and Rh in used automobile catalyst - powder Certified values Pt 1777 ± 15 mg/kg Pd 279 ± 6 mg/kg Rh 338 ± 4 mg/kg	250 g
NIST-RM 8496	Eucalyptus hardwood bleached kraft pulp - Properties (RM) Properties of fibres and paper sheets	10 sheets
ERM-EG001	Antimony implanted in silicon - chip (1 cm x 1 cm x 0.05 cm) (BAM-L001/IRMM-302) Compound Certified value Uncertainty Areal density of Sb atoms /10 ¹⁶ cm ⁻²4.81 0.06 Isotope amount ratio n(¹²¹ Sb) /n(¹²³ Sb)1.435 0.006	chip
	IBPO disperse dye samples Samples of potentially sensitising disperse dyes from the Institute of Dyes and Organic Products (IBPO) in Poland provided with a certificate of analysis including TLC and VIS spectroscopy results. Intended for use in testing textile products eco-labeled according to the ecological criteria established in Commission Decision 2002/371/EC	
IBPO201	C.I. Disperse Blue 7, C.I. No. 62500 (technical)	1 g
IBPO204	C.I. Disperse Yellow 1, C.I. No. 10345 (technical)	1 g
IBPO205	C.I. Disperse Yellow 9, C.I. No. 10375 (technical)	1 g
IBPO206	C.I. Disperse Yellow 49 (technical)	1 g
IBPO207	C.I. Disperse Red 11, C.I. No. 62015 (technical)	1 g
IBPO208	C.I. Disperse Red 17, C.I. No. 11210 (technical)	1 g
IBPO210	Disperse Blue 35 (technical) C.I. none, contains 4 dye components - violet blue (main component)	1 g
IBPO211	Disperse Orange 11 (technical) C.I. 60700, contains 5 dye components - orange (main component)	1 g
IBPO212	Disperse Orange 1 (technical) C.I. 11080, contains three dye components - orange (main component)	1 g
New IBPO213	Disperse Orange 61	1 g
FL-32944-10MG	Disperse Red 1-D3, C.I. No. 11110 OEKANAL®	10 mg
FL-32946-10MG	Disperse Yellow 3-D3 OEKANAL®	10 mg

Miscellaneous matrix reference materials

Code	Product	Unit
ERM-AC316	Solvent Yellow 124 (SY124, Sudan 455, Somalia Yellow, T10) The fuel dye Solvent Yellow 124 (SY124) was introduced as a common marker in the European Union in 2002 to distinguish low duty fuels from higher taxed road fuels. ERM-AC316 is a solvent-free certified reference material for SY124 to be used to help accurately determine the amount of SY124 in solutions, thus enabling the appropriate quantity of marker to be added. Certified purity..... 95 %	200 mg
New NIST-RM 8395	Tissue Engineering Reference Scaffold This Reference Material (RM) is intended to provide a common tissue-engineering scaffold for measurement comparisons. A unit consists of one free-form fabricated poly(ϵ -caprolactone) scaffold approximately 20 mm in external diameter, 5 mm in external height, 200 μ m in strut diameter, 200 μ m in strut spacing, and 47 % porosity. Reference values for strut diameter, strut spacing, and porosity are provided	1 scaffold
New NIST-RM 8396	Tissue Engineering Reference Scaffold This Reference Material (RM) is intended to provide a common tissue-engineering scaffold for measurement comparisons. A unit consists of one free-form fabricated poly(ϵ -caprolactone) scaffold approximately 20 mm in external diameter, 5 mm in external height, 200 μ m in strut diameter, 300 μ m in strut spacing, and 60 % porosity. Reference values for strut diameter, strut spacing, and porosity are provided.	1 scaffold
New NIST-RM 8397	Tissue Engineering Reference Scaffold This Reference Material (RM) is intended to provide a common source tissue-engineering scaffold for measurement comparisons. A unit consists of one free-form fabricated poly(ϵ -caprolactone) scaffold approximately 20 mm in external diameter, 5 mm in external height, 200 μ m in strut diameter, 450 μ m in strut spacing, and 69 % porosity. Reference values for strut diameter, strut spacing, and porosity are provided.	1 scaffold

Miscellaneous matrix reference materials

Forensic matrix reference materials

Code	Product	Unit
NIST-2460	Standard bullet Standard Reference Material (SRM [®]) NIST-2460 is a bullet signature standard comprising bullet profile signatures of six land engraved areas (LEAs) from fired bullets. This SRM is intended primarily for use as a check standard for crime laboratories to help verify that the computerized optical equipment for bullet imaging and profiling is operating properly. A unit of NIST-2460 consists of an SRM standard bullet that is mounted on a blue stub.	Each
New NIST-2905	Trace particulate explosive simulants Standard Reference Material (SRM) 2905 is a surrogate for explosives residues and is intended for use in evaluating analytical equipment used for the detection of trace explosives, which may include those based on ion mobility spectrometry. NIST-2905 consists of four non-explosive materials prepared from inert particles having a diameter of approximately 20 μ m to 30 μ m that are coated with trace levels of explosives. Two materials contain military-grade trinitrotoluene (TNT) with nominal concentrations of 0.01 % and 0.1 % mass fractions, and two materials contain Composition C-4 plastic explosive with nominal concentrations of 0.01 % and 0.1 % mass fractions. The Composition C-4 materials contain the explosives hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) and octahydro-1,3,5,7-tetranitro-1,3,5,7-tetrazocine (HMX). Certified concentrations are provided for TNT, RDX, and HMX. A unit of NIST-2905 consists of four individual plastic squeeze bottles each containing approximately 1 g of the trace particulate explosives materials. Certified concentrations for RDX and HMX in NIST-2905, 0.01 % Composition C-4 (nominal) Explosive Mass Fraction RDX 0.0777 \pm 0.0009 mg/g HMX.....0.00866 \pm 0.00008 mg/g Certified Concentrations for RDX and HMX in NIST2905, 0.1 % Composition C-4 (nominal) Explosive Mass Fraction RDX 0.687 \pm 0.014 mg/g HMX.....0.0757 \pm 0.0009 mg/g Certified Concentrations for TNT in NIST-2905, 0.01 % TNT (nominal) Explosive Mass Fraction TNT 0.097 \pm 0.001 mg/g Certified Concentrations for TNT in NIST-2905, 0.1 % TNT (nominal) Explosive Mass Fraction TNT 0.976 \pm 0.007 mg/g	150 g

Code	Product	Unit																		
Miscellaneous matrix reference materials																				
NIST-RM 8480	<p>Secondary ferrite number standard - Low range</p> <p>This Reference Material (RM) is intended for the calibration of instruments used to measure weld metal ferrite content in accordance with American National Standards Institute (ANSI), American Welding Society (AWS) and International Standards Organisation (ISO) normative standards ANSI/AWS A4.2 and ISO 8249. The ferrite content is measured in terms of a method defined quantity, the Ferrite Number (FN). NIST measurements were made in accordance with ANSI/AWS A4.2. Description and Source of Material: Each RM unit is a set of eight individually measured specimens. Each specimen is approximately 10 mm × 12 mm × 20 mm, and has an identification number scribed on one of the 12 mm × 20 mm faces. The measurement surface is the face opposite the surface that contains the identification number. RM 8480 comprises eight specimens having FN values ranging from 0 FN to 30 FN. The related RM 8481 Secondary Ferrite Number Standard - High Range, comprises eight specimens having FN values ranging from 30 FN to 120 FN.</p> <p>The RM was made from centrifugal castings of chromium-nickel steel alloys. The ferrite content was varied by adjusting the composition of the alloy. The cast specimens approximate the ferrite distribution in a weld deposit and have a solidification structure similar to that of welds. Like the ferrite in welds, the magnetic response of the ferritic (magnetic) phase varies with alloy composition. The homogeneity of the cast material was demonstrated to be sufficient for use as secondary FN standards.</p>	set																		
NIST-2696	<p>Silica Fume</p> <p>This Standard Reference Material (SRM[®]) is intended primarily for use in evaluating chemical and instrumental methods of analysis of silica fume used in conjunction with product specifications.</p> <p>Certified values</p> <table> <tbody> <tr> <td>SiO₂</td> <td>95.61 ± 0.37%</td> <td>MgO.....</td> <td>0.235 ± 0.024%</td> <td>ZnO</td> <td>0.051 ± 0.005%</td> </tr> <tr> <td>Al₂O₃</td> <td>0.2080 ± 0.0071%</td> <td>K₂O</td> <td>0.652 ± 0.028%</td> <td></td> <td></td> </tr> <tr> <td>CaO</td> <td>0.426 ± 0.016%</td> <td>Mn₂O₃.....</td> <td>0.032 ± 0.004%</td> <td></td> <td></td> </tr> </tbody> </table>	SiO ₂	95.61 ± 0.37%	MgO.....	0.235 ± 0.024%	ZnO	0.051 ± 0.005%	Al ₂ O ₃	0.2080 ± 0.0071%	K ₂ O	0.652 ± 0.028%			CaO	0.426 ± 0.016%	Mn ₂ O ₃	0.032 ± 0.004%			70 g
SiO ₂	95.61 ± 0.37%	MgO.....	0.235 ± 0.024%	ZnO	0.051 ± 0.005%															
Al ₂ O ₃	0.2080 ± 0.0071%	K ₂ O	0.652 ± 0.028%																	
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LGCQC4001	<p>Composite foam material with TBT</p> <p>Indicative value</p> <p>Tributyl tin (as Sn).....33 mg/kg</p>	2 g																		