

List of available NMIJ CRMs (1)

*: Reference Material (NMIJ RM)
Date is expiration for certification

Industrial Material CRMs for EPMA

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|------------------|--|
| 1001-a to 1005-a | Fe-Cr Alloy for EPMA, Cr: 5-40 % March 31, 2023 |
| 1006-a to 1010-a | Fe-Ni Alloy for EPMA, Ni: 5-60 % March 31, 2023 |
| 1017-a | Stainless Steel for EPMA One year from the date of shipment |
| 1018-a | Ni(36 %) - Fe Alloy for EPMA One year from the date of shipment |
| 1019-a | Ni(42%) - Fe Alloy for EPMA One year from the date of shipment |
| 1020-a | High Nickel Alloy for EPMA One year from the date of shipment |

Industrial Material CRMs

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|---------|---|
| 5202-a | SiO ₂ /Si Multilayer Film One year from the date of shipment |
| 5203-a | GaAs/AlAs Super Lattice One year from the date of shipment |
| 5205-a | Multiple BN Delta-Layer Film One year from the date of shipment |
| 5206-a | Multiple BN Delta-layer Film on Arsenic-doped Si Substrate One year from the date of shipment |
| 5207-a | Tungsten Dot-array One year from the date of shipment |
| 5601-a | Synthetic Fused Silica for Positron Hole-size Measurements One year from the date of shipment |
| 5602-a | Polycarbonate for Positron Hole-size Measurements One year from the date of shipment |
| 5603-a | Low Energy Arsenic Implanted Silicon (dose level 10 ¹⁵ atoms/cm ²) March 31, 2020 |
| 5604-a | Low Energy Arsenic Implanted Silicon (dose level 10 ¹⁴ atoms/cm ²) March 31, 2021 |
| 5605-a | Hafnium Oxide Film for Quantitative Analysis of Hf One year from the date of shipment |
| 5606-a | Single-Crystal Silicon for Positron Defect Measurements One year from the date of shipment |
| 5607-a* | Stainless Steel for Positron Defect Measurements One year from the date of shipment |
| 5701-a | Polystyrene Latex Nanoparticle (120 nm) One year from the date of shipment |
| 5702-a | Polystyrene Latex Nanoparticle (150 nm) One year from the date of shipment |
| 5703-a | Polystyrene Latex Nanoparticle (200 nm) One year from the date of shipment |
| 5711-a* | Titanium (IV) Oxide Nanoparticles (specific surface area 11 m ² /g, large particle size) One year from the date of shipment |

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| 5712-a* | Titanium (IV) Oxide Nanoparticles (specific surface area 57 m ² /g, small particle size) One year from the date of shipment |
| 5713-a* | Titanium (IV) Oxide Nanoparticles (specific surface area 76 m ² /g, small particle size) One year from the date of shipment |
| 5714-a | Carbon Black (Nitrogen Specific Volume Adsorbed - BET100) One year from the date of shipment |
| 8001-a 8002-a | Fine Silicon Carbide Powder for Fine Ceramics (α-phase & β-phase) March 31, 2024 |
| 8006-a 8007-a | Fine Alumina Powder for Fine Ceramics - Low Purity & High Purity March 31, 2020 |

High Purity Inorganic CRMs

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| 3001-c | Potassium Hydrogen Phthalate One year from the date of shipment |
| 3002-a | Potassium Dichromate One year from the date of shipment |
| 3003-b | Arsenic(III) Trioxide One year from the date of shipment |
| 3004-a | Amidosulfuric Acid One year from the date of shipment |
| 3005-a | Sodium Carbonate One year from the date of shipment |
| 3006-a | Potassium Iodate One year from the date of shipment |
| 3007-a(02) | Sodium Oxalate One year from the date of shipment |
| 3008-a | Sodium Chloride One year from the date of shipment |
| 3009-a | Zinc One year from the date of shipment |
| 3011-a | Ammonium Chloride One year from the date of shipment |
| 3012-a | Tris(hydroxymethyl)aminomethane One year from the date of shipment |
| 3013-a | Calcium Carbonate One year from the date of shipment |
| 3681-a | Lead Isotopic Standard Solution 3 years from the date of shipment |
| 3682-a | Iron Isotopic Standard Solution 3 years from the date of shipment |
| 5121-a (BTO) | Electrolytic Conductivity Standard Solution - Aqueous Solution of Potassium Chloride (1 mol kg ⁻¹) 6 months from the date of shipment |
| 5122-a (BTO) | Electrolytic Conductivity Standard Solution - Aqueous Solution of Potassium Chloride (0.1 mol kg ⁻¹) 6 months from the date of shipment |
| 5123-a | Electrolytic Conductivity Standard Solution - Aqueous Solution of Potassium Chloride (0.01 mol kg ⁻¹) 6 months from the date of shipment |

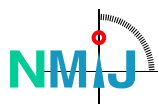
Organic CRMs (High Purity Material)

| | |
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| 4001-b | Ethanol March 31, 2022 |
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| 4003-b | Toluene One year from the date of shipment |
| 4004-a | 1,2-Dichloroethane One year from the date of shipment |
| 4005-a | Dichloromethane March 31, 2021 |
| 4006-a | Carbon Tetrachloride One year from the date of shipment |
| 4011-a(02) | <i>o</i> -Xylene March 31, 2021 |
| 4012-a | <i>m</i> -Xylene March 31, 2021 |
| 4013-a | <i>p</i> -Xylene One year from the date of shipment |
| 4014-a | 1,1-Dichloroethylene March 31, 2021 |
| 4019-a | Bromoform (Tribromomethane) One year from the date of shipment |
| 4020-a | Bromodichloromethane One year from the date of shipment |
| 4021-a | Ethylbenzene One year from the date of shipment |
| 4022-b | Diethyl Phthalate One year from the date of shipment |
| 4030-a | Bisphenol A One year from the date of shipment |
| 4036-a | Dibromochloromethane One year from the date of shipment |
| 4038-a | 1,2-Dichloropropane One year from the date of shipment |
| 4039-a | 1,4-Dichlorobenzene One year from the date of shipment |
| 4040-b | Acrylonitrile One year from the date of shipment |
| 4055-a | Styrene One year from the date of shipment |
| 4056-a | Perfluorooctanoic acid One year from the date of shipment |
| 4057-a | 1,4-Dioxane One year from the date of shipment |
| 4058-a | tert-Butylmethylether (MTBE) One year from the date of shipment |
| 4074-a | Trichloroacetic Acid One year from the date of shipment |
| 4601-b | 3,5-Bis(trifluoromethyl)benzoic Acid for Quantitative NMR (¹ H, ¹⁹ F) One year from the date of shipment |
| 4602-a | 1,4-Bis(trimethylsilyl)-2,3,5,6- tetrafluorobenzene for Quantitative NMR (¹ H, ¹⁹ F) One year from the date of shipment |
| 5401-a | Cyclohexane for Thermal Analysis March 31, 2021 |

Organic CRMs (Standard Solution)

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|--------|---|
| 4203-a | γ-HCH in 2,2,4-Trimethylpentane March 31, 2023 |
| 4213-a | Benzo[a]pyrene in 2,2,4-Trimethylpentane One year from the date of shipment |
| 4215-a | Sulfur in Toluene One year from the date of shipment |
| 4220-a | Potassium Perfluorooctanesulfonate in Methanol One year from the date of shipment |



List of available NMIJ CRMs (2)

*: Reference Material (NMIJ RM)
Date is expiry date for each CRM

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| 4221-a | Dibutyl Sulfide One year from the date of shipment |
| 4222-d | Water in Mesitylene (0.1 mg/g) 6 months from the date of shipment |
| 4228-a | Water in Anisole/Diethylene Glycol Dimethyl Ether (1 mg/g) One year from the date of shipment |
| 4229-a | Water in Methylcyclohexane (0.02 mg/g) 6 months from the date of shipment |
| 6206-a | Okadaic Acid Standard One year from the date of shipment |
| 6207-a | Dinophystoxin-1 (DTX-1) Standard Solution One year from the date of shipment |

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| 6024-a | L-Histidine March 31, 2023 |
| 6025-a | L-Cystine One year from the date of shipment |
| 6026-a | L-Glutamic acid March 31, 2022 |
| 6027-a | L-Aspartic acid March 31, 2022 |
| 6201-c | C-reactive Protein Solution 6 months from the date of shipment |
| 6202-a | Human Serum Albumin One year from the date of shipment |
| 6204-b | Ribonucleic Acid (RNA) Solutions for Quantitative Analysis 6 months from the date of shipment |
| 6205-a | Deoxyribonucleic Acid (DNA) Solutions for Quantitative Analysis (1 ng/μL, 600-bp) One year from the date of shipment |
| 6209-a | Human Insulin Solution One year from the date of shipment |
| 6401-b | Cortisol in Human Serum (3 Concentration Levels) One month from the date of shipment |
| 6901-b | C-peptide One year from the date of shipment |

Organic CRMs (for Clinical Chemistry and Bioanalysis)

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| 6001-a | Cholesterol 3 years from the date of shipment, or until Mar. 31, 2021, whichever comes earlier |
| 6002-a | Testosterone One year from the date of shipment |
| 6003-a | Progesterone One year from the date of shipment |
| 6004-a | 17β-Estradiol One year from the date of shipment |
| 6005-a | Creatinine One year from the date of shipment |
| 6006-a | Urea One year from the date of shipment |
| 6007-a | Hydrocortisone One year from the date of shipment |
| 6008-a | Uric Acid One year from the date of shipment |
| 6009-a | Triolein One year from the date of shipment |
| 6011-a | L-Alanine March 31, 2021 |
| 6012-a | L-Leucine March 31, 2021 |
| 6013-a | L-Isoleucine One year from the date of shipment |
| 6014-a | L-Phenylalanine One year from the date of shipment |
| 6015-a | L-Valine One year from the date of shipment |
| 6016-a | L-Proline One year from the date of shipment |
| 6017-b | L-Arginine One year from the date of shipment |
| 6018-a | L-Lysine Monohydrochloride March 31, 2021 |
| 6019-a | L-Tyrosine March 31, 2023 |
| 6020-a | L-Threonine March 31, 2023 |
| 6021-a | L-Serine March 31, 2023 |
| 6022-a | Glycine March 31, 2022 |
| 6023-a | L-Methionine One year from the date of shipment |

Environmental CRMs (for Environment Analysis)

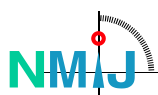
| | |
|--------|---|
| 7202-c | Trace Elements in River Water (Elevated Level) One year from the date of shipment |
| 7302-a | Trace Elements in Marine Sediment March 31, 2021 |
| 7303-a | Trace Elements in Lake Sediment March 31, 2021 |
| 7304-a | PCBs and Organochlorine Pesticides in Marine Sediment (High Pollutant Concentrations) March 31, 2024 |
| 7307-a | PAHs in Fresh Water Lake Sediment One year from the date of shipment |
| 7407-a | Organic Contaminants Human Serum 6 months from the date of shipment |
| 7601-a | Seawater for Nutrients - Extremely Low Concentration One year from the date of shipment |
| 7602-a | Seawater for Nutrients - Middle Concentration One year from the date of shipment |
| 7603-a | Seawater for Nutrients - High Concentration One year from the date of shipment |
| 7906-a | Polychlorinated Biphenyl Mixture in Nonane One year from the date of shipment |
| 8301-a | Bioethanol 6 months from the date of shipment |
| 8302-a | Biodiesel Fuel (Palm Oil-Based) 6 months from the date of shipment |

Environmental CRMs (for Food Analysis)

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| 7203-a | Tap Water for Heavy Metals (Elevated Level) One year from the date of shipment |
| 7402-a | Trace Elements, Arsenobetaine and Methylmercury in Cod Fish Tissue One year from the date of shipment |
| 7404-a | Organic Pollutants in Japanese Seabass Tissue November 30, 2019 |
| 7405-b | Trace Elements and Arsenic Compounds in Seaweed (Hijiki) Coming Soon |
| 7406-a | Trace Elements in Squid Powder One year from the date of shipment |
| 7501-a | Trace Elements in White Rice Flour (Cd Level I) March 31, 2023 |
| 7502-a | Arsenic Compounds and Trace Elements in White Rice Flour (Cd Level II) March 31, 2023 |
| 7503-b | Arsenic Compounds and Trace Elements in White Rice Flour One year from the date of shipment |
| 7504-a | Pesticides in Unpolished Rice 3 months from the date of shipment |
| 7505-a | Trace Elements in Tea Leaf Powder March 31, 2030 |
| 7508-a | Pesticides in Cabbage 3 months from the date of shipment |
| 7510-a | Pesticides in Apple 3 months from the date of shipment |
| 7511-a | Trace Elements in Soybean March 31, 2022 |
| 7512-a | Trace Elements in Milk Powder March 31, 2022 |
| 7520-a | Diarrhetic Shellfish Toxins in Scallop Midgut Gland 6 months from the date of shipment |
| 7521-a | Diarrhetic Shellfish Toxins in Scallop Edible Parts 3 months from the date of shipment |
| 7531-a | Cadmium in Brown Rice Flour One year from the date of shipment |
| 7532-a | Arsenic Compounds and Trace Elements in Brown Rice Flour One year from the date of shipment |
| 7533-a | Arsenic Compounds and Trace Elements in Brown Rice Flour One year from the date of shipment |
| 7541-a | ¹³⁴ Cs and ¹³⁷ Cs in Brown Rice March 31, 2024 |
| 7541-b | ¹³⁴ Cs and ¹³⁷ Cs in Brown Rice March 31, 2024 |

Environmental CRMs (for Chemical Speciation)

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| 7901-a | Arsenobetaine Solution One year from the date of shipment |
| 7912-a | Arsenate [As(V)] Solution One year from the date of shipment |
| 7913-a | Dimethylarsinic Acid Solution One year from the date of shipment |



List of available NMIJ CRMs (3)

*: Reference Material (NMIJ RM)
Date is expiry date for each CRM

Polymer CRMs

| | |
|---------|--|
| 5001-a | Polystyrene 2400 July 27, 2023 |
| 5004-a | Polystyrene 1000 March 31, 2024 |
| 5005-a | Poly(ethylene glycol) 400 One year from the date of shipment |
| 5006-a | Poly(ethylene glycol) 1000 One year from the date of shipment |
| 5007-a | Poly(ethylene glycol) 1500 One year from the date of shipment |
| 5008-a | Polystyrene (Polydisperse) One year from the date of shipment |
| 5009-a* | Polystyrene 8500 March 31, 2021 |
| 5010-a | Poly(ethylene glycol) Nonylphenyl Ether March 31, 2020 |
| 5011-a | Poly(ethylene glycol)(23mer) Stop Selling |
| 5012-a* | Polystyrene (for Light Scattering) One year from the date of shipment |

CRMs for Green Procurement

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| 8102-a | Heavy Metals (Cd, Cr, Pb) in ABS Resin Pellet - Low Concentration March 31, 2022 |
| 8103-a | Heavy Metals (Cd, Cr, Pb) in ABS Resin Pellet - High Concentration March 31, 2022 |
| 8105-a | Heavy Metals (Cd, Cr, Pb) in ABS Resin Disk - Low Concentration March 31, 2023 |
| 8108-b | Polybrominated Diphenyl Ethers in Polystyrene One year from the date of shipment |
| 8109-a | Polybrominated Diphenyl Ethers in Poly(Vinyl Chloride) Resine One year from the date of shipment |
| 8110-a | Polybrominated Diphenyl Ethers in Polystyrene (High Concentration) One year from the date of shipment |
| 8112-a | Heavy Metals (Cd, Cr, Hg, Pb) in ABS Resin Pellet - Low Concentration 3 years from the date of shipment |
| 8115-a | Heavy Metals (Cd, Cr, Hg, Pb) in ABS Resin Disk - Low Concentration 3 years from the date of shipment |
| 8123-a | Heavy Metals (Cd, Cr, Hg, Pb) in PVC Resin Pellet - High Concentration March 31, 2021 |
| 8133-a | Heavy Metals (Cd, Cr, Hg, Pb) in PP Resin Pellet - High Concentration March 31, 2021 |
| 8136-a | Heavy Metals (Cd, Cr, Hg, Pb) in PP Resin Disk - High Concentration March 31, 2021 |
| 8137-a | PP Resin Pellet for Bromine Analysis One year from the date of shipment |

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| 8152-a | Polyvinyl Chloride (Phthalate Esters in PVC Resin Pellet) One year from the date of shipment |
| 8155-a | Perfluoroalkyl Substances in ABS Resin 6 months from the date of shipment |
| 8202-a | Lead-Free Solder Chip (Sn96.5Ag3Cu0.5) - Pb Low Concentration March 31, 2020 |
| 8203-a | Lead-Free Solder Chip (Sn96.5Ag3Cu0.5) - Pb High Concentration March 31, 2020 |

CRMs for Thermophysical Properties

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|---------|---|
| 1101-a* | Single Crystal of Silicon *Form 1 & Form 2 (available separately) March 31, 2020 |
| 1102-a* | Glass-like Carbon *Form 1 & Form 2 (available separately) March 31, 2020 |
| 1401-a* | Isotropic Graphite March 31, 2025 |
| 5803-a | Single-Crystal of Silicon (at Cryogenic Temperature) *Form 1 & Form 2 (available separately) March 31, 2025 |
| 5804-b | Isotropic Graphite for Thermal Diffusivity Measurement March 31, 2021 |
| 5805-a | High-purity copper March 31, 2024 |
| 5806-a | Single Crystal of Silicon (at Cryogenic Temperature) March 31, 2021 |
| 5807-a | Al ₂ O ₃ -TiC Ceramics March 31, 2025 |
| 5808-a | Molybdenum Film (400 nm) March 31, 2021 |

Gas CRMs

NOTICE: The Gas CRMs are build to order.

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| 3402-c | Sulfur Dioxide |
| 3403-b | Dinitrogen Oxide in Nitrogen (High Concentration) 2 years from the date of shipment |
| 3404-c | Oxygen |
| 3406-e | Carbon Monoxide One year from the date of shipment |
| 3407-b | Carbon Dioxide |
| 3408-a | Oxygen in Nitrogen (10 μmol/mol) |
| 3409-a | Nitrogen in Argon (10 μmol/mol) |
| 3409-b | Nitrogen in Argon (50 μmol/mol) One year from the date of shipment |
| 3409-c | Nitrogen in Argon (100 μmol/mol) One year from the date of shipment |
| 3410-a | Nitrogen for LNG analysis One year from the date of shipment |
| 4051-c | Methane One year from the date of shipment |
| 4052-c | Propane One year from the date of shipment |
| 4064-a | Ethane One year from the date of shipment |
| 4065-a | Isobutane One year from the date of shipment |
| 4066-a | Butane One year from the date of shipment |
| 4067-a | Isopentane One year from the date of shipment |
| 4068-a | Pentane One year from the date of shipment |
| 4403-a | SF ₆ and CF ₄ in N ₂ (Emission Level) March 31, 2020 |
| 4407-a | Hexane in methane One year from the date of shipment |