AIR & EMISSIONS

Matrices consisting of organic, inorganic, and particulate matter for testing emissions and ambient air. Standards are designed to meet regulations of the United States Environmental Protection Clean Air Act and may be used to satisfy PT requirements worldwide.

Air & Emissions PT Schedule

2024

Air & Emissions			
	Scheme #	Opens	Closes
Q	AE 67	Jan 29	Mar 14
Q	AE 68	Apr 29	Jun 13
Q	AE 69	Jul 29	Sep 12
Q	AE 70	Oct 25	Dec 9

2025

Air & Emissions			
	Scheme #	Opens	Closes
Q	AE 71	Jan 31	Mar 17
Q	AE 72	Apr 28	Jun 12
Q	AE 73	Jul 28	Sep 11
Q	AE 74	Oct 24	Dec 8

Schedule subject to change – see Waters ERA's website at **eraqc.com**

Contents

CRM: A reference material characterized by a metrologically valid procedure for one or more specified properties, accompanied by a reference material certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability.

A complete listing of ERA's CRMs can be found on our Scope of Accreditation for general requirements for competence of reference material producers available at www.eraqc.com/AboutERA/Accreditations.

PT: A Proficiency Test (PT) is an analysis of what is often referred to as a blind sample or a sample with unknown concentrations of analytes for the purpose of evaluating a laboratory's analytical performance.

QR: Similar to a Proficiency Test, a QuiK Response (QR) is a sample with unknown concentrations. However, unlike a scheduled PT, QR is on-demand and available at any time. Plus, your results are returned within two business days. QuiK Response can be used as a bilateral PT as referenced in the IUPAC/CITAC guide: Selection and use of PT schemes for a limited number of participants – chemical analytical labs.

RM: A material, sufficiently homogeneous and stable with respect to one or more specified properties, which has been established to be fit for its intended use in a measurement process.

Q All Waters ERA Air & Emissions PTs open quarterly. Quarterly months are January, April, July, and October.

Volatiles

Volatiles in Gas Cylinder*

RM**	PT	QR
Cat. #1100	Cat. #1000 Q	Cat. #1100QR

One pressurized gas cylinder containing 87 L of gas at 1500 psig (103 bar) for use with EPA methods TO-14, TO-15, or other applicable methods. Contains at least 10 analytes, randomly selected from the list below, at 2–50 ppbv (4–100 ppbv) for Total Xylenes.

- Acetone
- Benzene
- Benzy chloride
- Bromodichloromethane
- Bromoform
- Bromomethane
- 1,3-Butadiene
- 2-Butanone (MEK)
- Methyl tert-butyl ether (MTBE)
- Carbon disulfide
- Carbon tetrachloride
- Chlorobenzene
- Chlorodibromomethane
- Chloroethane
- Chloroform
- Chloromethane
- Cyclohexane
- 1,2-Dibromoethane (EDB)
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Dichlorodifluoromethane (Freon 12)
- 1,1-Dichloroethane
- 1,2-Dichloroethane
- 1,1-Dichloroethylene
- cis-1,2-Dichloroethylene
- trans-1,2-Dichloroethylene
- 1,2-Dichloropropane
- cis-1,3-Dichloropropylene
- trans-1,3-Dichloropropylene
- 1,2-Dichlorotetrafluoroethane (Freon 114)
- Ethyl acetate
- Ethylbenzene
- p-Ethyltoluene
- n-Heptane
- Hexachlorobutadiene
- n-Hexane
- 2-Hexanone
- Isopropyl alcohol
- Methylene chloride
- Methyl methacrylate
- 4-Methyl-2-pentanone (MIBK)
- Methyl tert-butyl ether (MTBE)
- Propylene
- Styrene
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethylene
- Toluene
- Trichloroethene
- 1,2,4-Trichlorobenzene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichlorofluoromethane (Freon 11)
- Trichlorotrifluoromethane (Freon 113)
- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene
- Vinyl bromide
- Vinyl chloride
- Xylenes, total
- m&p-Xylene
- o-Xylene

*Volatiles in Gas Cylinder ships as dangerous goods.

** Reference Material (RM)

Volatiles on Sorbent

CRM	PT	QR
Cat. #1101	Cat. #1001 Q	Cat. #1101QR

One 2 mL flame-sealed ampule for spiking client-specific sorbent. Use with EPA Methods TO-17, 0030, 0031, or other applicable methods. Contains at least 24 analytes, randomly selected from the list below, at 50–2000 ng/sample (200–3000 ng/sample for Total Xylenes) after preparation.

- Acetone
- Acetonitrile
- Acrolein
- Acrylonitrile
- Benzene
- Bromobenzene
- Bromochloromethane
- Bromodichloromethane
- Bromoform
- Bromomethane
- 2-Butanone (MEK)
- n-Butylbenzene
- sec-Butylbenzene
- tert-Butylbenzene
- Carbon disulfide
- Carbon tetrachloride
- Chlorobenzene
- Chlorodibromomethane
- Chloroethane
- 2-Chloroethyl vinyl ether
- Chloroform
- Chloromethane
- 2-Chlorotoluene
- 4-Chlorotoluene
- 1,3-Dichloropropane
- 2,2-Dichloropropane
- 1,1-Dichloropropene
- 1,2-Dibromo-3-chloropropane (DBCP)
- 1,2-Dibromoethane (EDB)
- Dibromomethane
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- Dichlorodifluoromethane (Freon 12)
- 1,1-Dichloroethane
- 1,2-Dichloroethane
- 1,1-Dichloroethene
- cis-1,2-Dichloroethene
- trans-1,2-Dichloroethene
- 1,2-Dichloropropane
- cis-1,3-Dichloropropene
- trans-1,3-Dichloropropene
- Ethylbenzene
- Hexachlorobutadiene
- Hexachloroethane
- 2-Hexanone
- Isopropylbenzene
- 4-Isopropyltoluene
- Methyl tert-butyl ether (MTBE)
- Methylene chloride
- 4-Methyl-2-pentanone (MIBK)
- Naphthalene
- Nitrobenzene
- n-Propylbenzene
- Styrene
- 1,1,1,2-Tetrachloroethane
- 1,1,2,2-Tetrachloroethane
- Tetrachloroethene
- Toluene
- 1,2,3-Trichlorobenzene
- 1,2,4-Trichlorobenzene
- 1,1,1-Trichloroethane
- 1,1,2-Trichloroethane
- Trichloroethlyene
- Trichlorofluoromethane
- 1,2,3-Trichloropropane
- 1,2,4-Trimethylbenzene
- 1,3,5-Trimethylbenzene
- Vinyl acetate
- Vinyl chloride
- Xylenes, total
- m&p-Xylene
- o-Xylene

Semivolatiles

Semivolatiles on Polyurethane Foam

CRM	PT	QR
Cat. #1110	Cat. #1010 Q	Cat. #1110QR

Two 2 mL flame-sealed ampules plus one polyurethane foam. Use with EPA Method 0010, or other applicable methods. Contains at least 42 analytes, randomly selected from the list below, at 10–225 µg/sample (200–1000 µg/sample for Benzidine) after preparation.

- Acenaphthene
- Acenaphthylene
- Aniline
- Anthracene
- Benzidine
- Benzo(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(a)pyrene
- Benzyl alcohol
- 4-Bromophenyl phenyl ether
- Butyl benzyl phthalate
- Carbazole
- 4-Chloroaniline
- Bis(2-chloroethoxy)methane
- Bis(2-chloroethyl)ether
- Bis(2-ethylhexyl)phthalate
- 1-Chloronaphthalene
- 2-Chloronaphthalene
- 4-Chlorophenyl phenyl ether
- Chrysene
- Dibenz(a,h)anthracene
- Dibenzofuran
- Di-n-butyl phthalate
- 1,2-Dichlorobenzene
- 1,3-Dichlorobenzene
- 1,4-Dichlorobenzene
- 3,3'-Dichlorobenzidine
- Diethyl phthalate
- Dimethyl phthalate
- 2,4-Dinitrotoluene
- 2,6-Dinitrotoluene
- Di-n-octyl phthalate
- Fluoranthene
- Fluorene
- Hexachlorobenzene
- Hexachlorobutadiene
- Hexachlorocyclopentadiene
- Hexachloroethane
- Indeno(1,2,3-cd)pyrene
- Isophorone
- 2-Methylnaphthalene
- Naphthalene
- 2-Nitroaniline
- 3-Nitroaniline
- 4-Nitroaniline
- Nitrobenzene
- N-Nitrosodiethylamine
- N-Nitrosodimethylamine (NDMA)
- N-Nitrosodiphenylamine
- N-Nitroso-di-n-propylamine
- 2,2'-Oxybis(1-chloropropane)
- Pentachlorobenzene
- Phenanthrene
- Pyrene
- Pyridine
- o-Toluidine
- 1,2,4,5-Tetrachlorobenzene
- 1,2,4-Trichlorobenzene
- Benzoic Acid
- 4-Chloro-3-methylphenol
- 2-Chlorophenol
- 2,4-Dichlorophenol
- 2,6-Dichlorophenol
- 2,4-Dimethylphenol
- 2,4-Dinitrophenol
- 2-Methyl-4,6-dinitrophenol
- 2-Methylphenol (o-Cresol)
- 4-Methylphenol (p-Cresol)
- 2-Nitrophenol
- 4-Nitrophenol
- Pentachlorophenol
- Phenol
- 2,3,4,6-Tetrachlorophenol
- 2,4,5-Trichlorophenol
- 2,4,6-Trichlorophenol

Organochlorine Pesticides on Polyurethane Foam

CRM	PT	QR
Cat. #1111	Cat. #1011 Q	Cat. #1111QR

One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Methods TO-04A, TO-10A, or other applicable methods. Contains at least 16 analytes, randomly selected from the list below, at 1–20 µg/sample after preparation.

- Aldrin
- alpha-BHC
- beta-BHC
- delta-BHC
- gamma-BHC (Lindane)
- alpha-Chlordane
- gamma-Chlordane
- 4,4'-DDD
- 4,4'-DDE
- 4,4'-DDT
- Dieldrin
- Endosulfan I
- Endosulfan II
- Endosulfan sulfate
- Endrin
- Endrin aldehyde
- Endrin ketone
- Heptachlor
- Heptachlor epoxide (beta)
- Methoxychlor

PCBs on Polyurethane Foam

CRM	PT	QR
Cat. #1112	Cat. #1012 Q	Cat. #1112QR

One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Methods TO-04A, TO-10A, or other applicable methods. Contains one aroclor, randomly selected from the list below, at 2–10 µg/sample after preparation.

- Aroclor 1016
- Aroclor 1221
- Aroclor 1232
- Aroclor 1242
- Aroclor 1248
- Aroclor 1254
- Aroclor 1260

PAHs on Polyurethane Foam

CRM	PT	QR
Cat. #1113	Cat. #1013 Q	Cat. #1113QR

One 2 mL flame-sealed ampule plus one polyurethane foam. Use with EPA Method TO-13A, or other applicable methods. Contains at least 13 analytes, randomly selected from the list below, at 10–200 µg/sample after preparation.

- Acenaphthene
- Acenaphthylene
- Anthracene
- Benzo(a)anthracene
- Benzo(b)fluoranthene
- Benzo(k)fluoranthene
- Benzo(g,h,i)perylene
- Benzo(a)pyrene
- Chrysene
- Dibenz(a,h)anthracene
- Fluoranthene
- Fluorene
- Indeno(1,2,3-cd)pyrene
- 1-Methylnaphthalene
- 2-Methylnaphthalene
- Naphthalene
- Phenanthrene
- Pyrene

Aldehydes & Ketones on Sorbent

CRM	PT	QR
Cat. #1114	Cat. #1014 Q	Cat. #1114QR

One 2 mL flame-sealed ampule to be spiked onto sorbent. Use with EPA Method TO-11A, or other applicable methods. Contains at least four analytes, randomly selected from the list below, at 0.5–10 µg/sample after preparation.

- Acetaldehyde
- Acetone
- Benzaldehyde
- 2-Butanone (MEK)
- Butyraldehyde (Butanal)
- Crotonaldehyde
- 2,5-Dimethylbenzaldehyde
- Formaldehyde
- Hexaldehyde (Hexanal)
- Isovaleraldehyde
- Propionaldehyde (Propanal)
- o-Tolualdehyde
- m-Tolualdehyde
- p-Tolualdehyde
- Valeraldehyde (Pentanal)

CRM – Certified Reference Material
PT – Proficiency Testing
QR – QuiK Response
RM – Reference Material

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Metals

Metals on Filter Paper

CRM	PT		QR
Cat. #1125	Cat. #1025	Q	Cat. #1125QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter ready for use with EPA Method 29 or other applicable methods.

Antimony	25–250 µg/filter
Arsenic	20–250 µg/filter
Barium	20–250 µg/filter
Beryllium	10–250 µg/filter
Cadmium	10–250 µg/filter
Chromium	15–250 µg/filter
Cobalt	10–250 µg/filter
Copper	10–250 µg/filter
Lead	20–350 µg/filter
Manganese	10–250 µg/filter
Nickel	20–250 µg/filter
Phosphorus	10–250 µg/filter
Selenium	20–250 µg/filter
Silver	30–250 µg/filter
Thallium	30–250 µg/filter
Zinc	20–250 µg/filter

Metals in Impinger Solution

CRM	PT		QR
Cat. #1126	Cat. #1026	Q	Cat. #1126QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 29, or other applicable methods.

Antimony	0.25–20 µg/mL
Arsenic	0.2–20 µg/mL
Barium	0.15–25 µg/mL
Beryllium	0.05–20 µg/mL
Cadmium	0.1–20 µg/mL
Chromium	0.2–20 µg/mL
Cobalt	0.1–25 µg/mL
Copper	0.2–20 µg/mL
Lead	0.2–20 µg/mL
Manganese	0.1–20 µg/mL
Nickel	0.15–30 µg/mL
Phosphorus	0.15–25 µg/mL
Selenium	0.15–25 µg/mL
Silver	0.5–20 µg/mL
Thallium	0.15–25 µg/mL
Zinc	0.15–25 µg/mL

Mercury on Filter Paper

CRM	PT		QR
Cat. #1127	Cat. #1027	Q	Cat. #1127QR

One 2 mL flame-sealed ampule containing approximately 2 mL of standard concentrate and a 50 mm polystyrene petri dish containing a single 47 mm glass fiber filter. Sample is ready for use with EPA Method 29, or other applicable methods.

Mercury	1–75 µg/filter

Mercury in Impinger Solution

CRM	PT		QR
Cat. #1128	Cat. #1028	Q	Cat. #1128QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Methods 29, 101a, or other applicable methods.

Mercury	0.9–200 ng/mL

Lead on Filter Paper

CRM	PT		QR
Cat. #1129	Cat. #1029	Q	Cat. #1129QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter spiked with lead ready-for-use with EPA Method 12 or other applicable methods.

Lead	20–350 µg/filter

Lead in Impinger Solution

CRM	PT		QR
Cat. #1130	Cat. #1030	Q	Cat. #1130QR

One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 12, or other applicable methods.

Lead	0.2–120 µg/mL

Chromium on Filter Paper

CRM	PT		QR
Cat. #1131	Cat. #1031	Q	Cat. #1131QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm fiber film filter for use with CARB Method 425, or other applicable methods.

Total chromium	1–20 µg/filter
Hexavalent chromium	1–20 µg/filter

Hexavalent Chromium in Impinger Solution

CRM	PT		QR
Cat. #1132	Cat. #1032	Q	Cat. #1132QR

One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 0061/7199, or other applicable methods.

Hexavalent chromium	45–880 µg/L

Inorganics

Hydrogen Halides & Halogens in Impinger Solution

CRM	PT		QR
Cat. #1140	Cat. #1040	Q	Cat. #1140QR

Two impinger solution samples packaged in 15 mL screw-top vials containing approximately 14 mL of standard concentrate for use with EPA Methods 26, 26a, or other applicable methods.

Total halides	10–1000 mg/L
Total halogens	10–200 mg/L
Hydrogen chloride	5–500 mg/L
Hydrogen fluoride	5–500 mg/L
Hydrogen bromide	5–100 mg/L
Bromine	5–100 mg/L
Chlorine	5–100 mg/L

Fluoride in Impinger Solution

CRM	PT		QR
Cat. #1141	Cat. #1041	Q	Cat. #1141QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Methods 13a, 13b, 14, or other applicable methods.

Fluoride	1–50 mg/dscm

Nitrogen Oxide in Impinger Solution

CRM	PT		QR
Cat. #1142	Cat. #1042	Q	Cat. #1142QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 7, or other applicable methods.

Oxides of nitrogen (NOx)	100–2000 mg/dscm

Sulfur Dioxide in Impinger Solution

CRM	PT		QR
Cat. #1143	Cat. #1043	Q	Cat. #1143QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA Method 6 and Method 8, or other applicable methods.

Sulfur dioxide	50–2000 mg/dscm

Sulfuric Acid & Sulfur Dioxide in Impinger Solution

CRM	PT		QR
Cat. #1144	Cat. #1044	Q	Cat. #1144QR

One impinger solution sample packaged in a 15 mL screw top vial containing approximately 14 mL of standard concentrate for use with EPA Method 8, or other applicable methods.

Sulfuric acid	5–150 mg/dscm

Ammonia in Impinger Solution

CRM	PT		QR
Cat. #1145	Cat. #1045	Q	Cat. #1145QR

One impinger solution sample packaged in a 15 mL screw-top vial containing approximately 14 mL of standard concentrate for use with EPA CTM 027, or other applicable methods.

Ammonium	0.1–10 mg/L

Particulate Matter on Filter Paper

CRM	PT		QR
Cat. #1150	Cat. #1050	Q	Cat. #1150QR

One filter paper sample packaged in a 50 mm polystyrene petri dish containing a single 47 mm tissue quartz filter ready for use with EPA Methods 5, 5A, 5B, 5D, 5F, or other applicable methods.

Particulate matter	50–600 mg/filter

Particulate Matter in Impinger Solution

CRM	PT		QR
Cat. #1151	Cat. #1051	Q	Cat. #1151QR

One impinger solution sample packaged in a 250 mL polyethylene bottle containing approximately 250 mL of standard ready for use with EPA Methods 5, 5A, 5B, 5D, 5F, or other applicable methods.

Particulate matter	140–675 mg/L

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Learn more about Air & Emissions products