MERCK

GO GREEN

Make the world a greener place with
high-quality products for environmental testing

The life science business of Merck operates
as MilliporeSigma in the U.S. and Canada.

The Life Science business of Merck which operated as MilliporeSigma in the U.S. and Canada, unites the innovative products, world-class services, and exceptional talents of Merck Millipore and Sigma-Aldrich to create a global leader in the life science industry.

A LEADER IN LIFE SCIENCE
A PARTNER FOR QUALITY

- We solve the toughest problems in the industry by collaborating with the global scientific community
- We provide scientists with best-in-class lab materials, technologies, and services
- We make research and production simpler, faster, and more successful

We fully support your work in environmental testing

- Products and services follow the latest regulations to ensure method compliance
- Substantial resources available for customer-specific solutions
- Warehouse and supply chain management for prompt delivery and local support
- Expert advice in routine or advanced applications and methods

Life Science Facts & Figures

We deliver confidence

- We are not just distributors, but also inventors, producers and partners
- We manufacture the majority of our products in-house
- Quality and service are as important to us as they are to you

This brochure is arranged by focus areas so you can quickly find the products you need.

Our core strengths:

- **Comprehensive portfolio and customer-focused innovation**
- **Balanced geographic reach**
- **Well-differentiated, industry-leading capabilities**

For further product details, applications, real-time availability, and ordering information, please visit:
SigmaAldrich.com/enviro

Corporate Responsibility

Go beyond

Enabling Sustainability

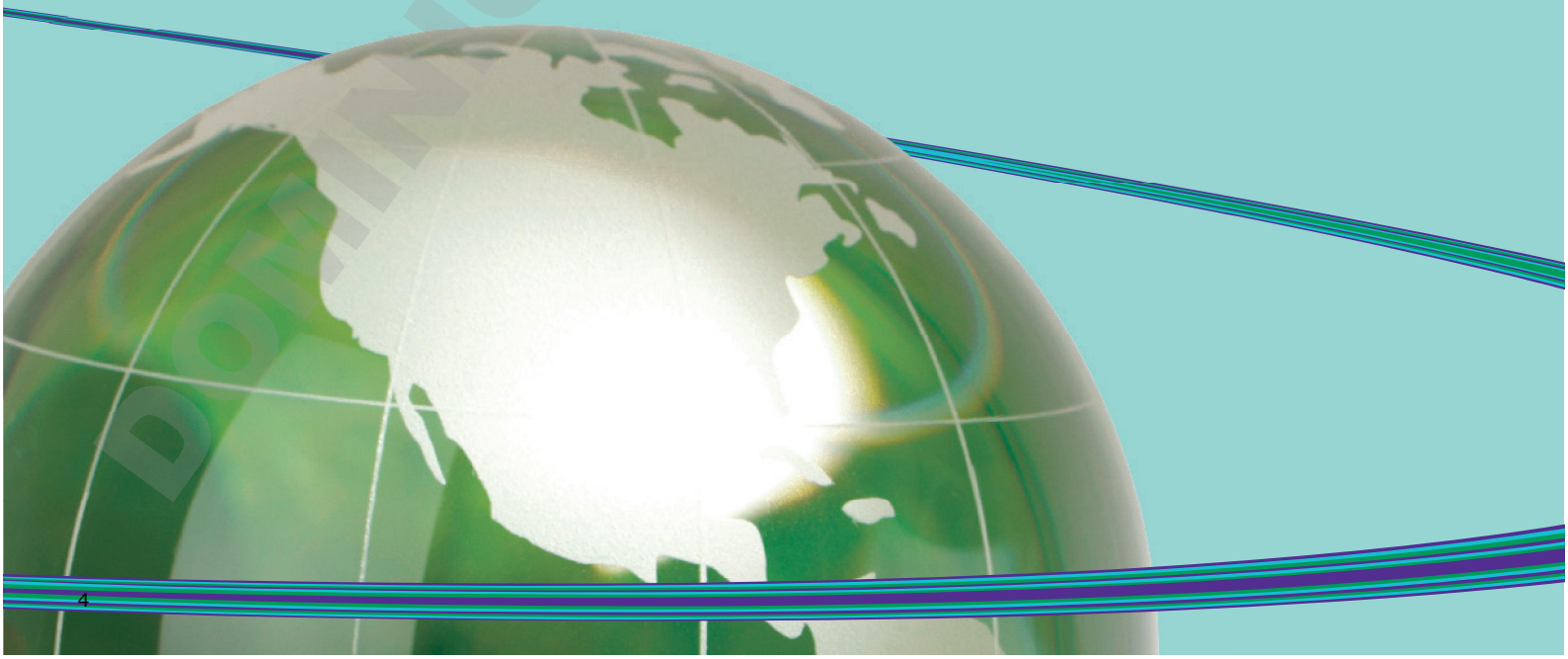
Our Design for Sustainability (DfS) program aims to reduce the environmental impact of our products across their entire lifecycle – from production, through use, to recycling. It is also intended to enhance the performance and convenience of our products. These principles were applied in the design of our EZ-Fit™ Manifold, which is used for microbiological water testing. Compared to its predecessor, the new model helps customers reduce autoclave-associated carbon emissions by 91%. Packaging was also optimized so that 47% less raw material is needed.

Respecting the Environment

Climate protection is an integral part of our culture, products, and processes. Since 2009, we have installed photovoltaic plants at production sites around the world: Billerica and Bedford, Massachusetts, USA (155 kW each); Molsheim, France (55 kW); Tel Aviv, Israel (50 kW); Rome, Italy (two plants at 96 kW and 88 kW); and Guatemala City, Guatemala (40 kW). In 2015, we commissioned a 400 kW plant in Shanghai, China, reducing the site's annual CO_2 emissions by 300 metric tons.

Living our Commitment

We also use our expertise to help solve the world's problems through initiatives like the Global Pharma Health Fund (GPHF). The charitable organization is currently working to eradicate counterfeit pharmaceuticals in developing and emerging countries. According to Interpol estimates, up to 30% of medicines in these regions are counterfeit or substandard. Besides providing financial support, we developed the GPHF-Minilab™ to test whether medicines contain correct concentrations of active pharmaceutical ingredients (APIs). The compact, portable lab fits into a tropics-resistant suitcase, and does not rely on external power sources – it only requires clean water.



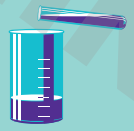
contents

Environmental Testing Workflow

Sample Collection

Preserve sample integrity during transport to the laboratory, and storage prior to sample preparation.

- Vials, Bottles and Jars **>> page 25**
- Chlorine Test Strips **>> page 25**
- Preservatives **>> page 25**
- Particulate Matter (PM) Filters **>> page 26**
- Active Air Sampling Devices **>> page 26**
- Passive Air Sampling Devices **>> page 27**
- Gas Sampling Bags and Glass Bulbs **>> page 27**



Sample Preparation

Isolate analytes from the matrix; deliver in a configuration compatible with the sample analysis technique.

- Organic Solvents **>> page 8**
- Sodium Sulfate, Magnesium Sulfate **>> page 10**
- Filter Discs **>> pages 10, 15**
- pH Test Strips **>> page 11**
- Inorganic Acids and Bases **>> pages 11, 13**
- Solid Phase Extraction (SPE) Tubes and Vacuum Manifolds **>> page 12**
- Solid Phase Microextraction (SPME) Fibers and Accessories **>> page 12**
- Purge Traps and Glassware **>> page 12**
- Derivatization Reagents **>> page 12**
- Syringe Tip Filters **>> page 15**
- Microbiology Water Filtration **>> page 18**
- Culture Media **>> page 19**
- Petri Dishes **>> page 20**

Sample Analysis

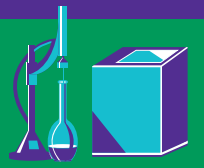
Obtain qualitative and quantitative results for environmental pollutants using various instrumentation.

- CRMs, RMs, and Analytical Standards **>> pages 9, 13, 14, 19, 21**
- GC and GC/MS Columns, Accessories, and Gas Purifiers **>> page 9**
- HPLC and LC/MS Columns and Accessories **>> page 12**
- HPLC Mobile Phases **>> page 8**
- Autosampler Vials, Caps, Inserts, and Syringes **>> page 9**
- Volumetric Titration Solutions **>> page 15**
- IC Eluents **>> page 15**
- Spectrophotometric Instruments and Test Kits **>> page 16**
- Bench-top/Hand-held Meters and Electrodes **>> page 17**
- Microscopes **>> page 20**

Quality Assurance

Safeguard data integrity across the environmental testing workflow.

- Matrix Material Standards **>> page 21**
- Proficiency Testing **>> page 22**



Water Purification

On-site generation (extraction blanks, rinse glassware/plastic ware, reagents, mobile phase).

- Water Purification Systems **>> page 23**

Lab Essentials

Supply chain solutions for products utilized across many areas in the laboratory.

- Glassware **>> page 24**
- Plastic Ware **>> page 24**
- Tools **>> page 24**
- Supplies **>> page 24**
- Equipment **>> page 24**
- Safety Products **>> page 24**
- Cleaning Reagents **>> page 24**
- Spill Kits **>> page 24**

A complete overview of our portfolio for environmental testing is available at:
SigmaAldrich.com/enviro

GO organic

Extraction and Analysis of Organic Compounds

SigmaAldrich.com/enviro-organics

Sample preparation typically involves partitioning organic pollutants into headspace using a purge process, or into an organic solvent through extraction. You may need a cleanup step to remove interferences and/or a concentration step to increase method sensitivity. The sample is then analyzed using gas chromatography (GC) or high performance liquid chromatography (HPLC).

exceptional purity

Choose from four exceptional series of **organic solvents** – specially made for GC and HPLC. They are all offered in various pack sizes, including returnable containers to reduce your carbon footprint.

- SupraSolv® solvents: ideal for extraction and GC analysis using MS, FID, or ECD detection; recovered from special distillation cuts, and tested for specific detectors to ensure high application security
- OmniSolv® solvents: offered in different grades for GC, high resolution GC (HR-GC), purge and trap, gradient HPLC, and LC/MS; outstanding purity and batch-to-batch consistency for unparalleled reliability in trace environmental analyses; only available in North America
- EMSURE® solvents: meet or exceed ACS requirements; may be used as extraction solvents, depending on sensitivity needs
- LiChrosolv® solvents: suitable for HPLC or LC/MS, either as an extraction solvent or as a mobile phase

Key Products	Cat. No.
MS SupraSolv® Dichloromethane	100668
OmniSolv® HR-GC Dichloromethane	DX0837
MS SupraSolv® Acetone,	100012
OmniSolv® HR-GC Acetone	AX0110
ECD and FID SupraSolv® n-Hexane	104371
OmniSolv® HR-GC Hexanes	HX0297
EMSURE® n-Hexane	104367
OmniSolv® Methanol for purge & trap	MX0482
Gradient grade LiChrosolv® Acetonitrile	100030
Gradient grade OmniSolv® Acetonitrile	AX0142
LC-MS LiChrosolv® Acetonitrile	100029
OmniSolv® LC-MS Acetonitrile	AX0156

Accredited to both ISO/IEC 17025 and ISO Guide 34, our manufacturing sites produce a multitude of **organic standards** (volatiles, semivolatiles, pesticides, PCBs, PAHs, flame retardants, etc.) as Certified Reference Materials (CRMs), Reference Materials (RMs), and analytical standards, for use as calibration standards, internal standards, surrogate standards, spiking solutions, and laboratory control samples (LCSs). You have the option of single-component solutions, multi-component mixtures, and highly characterized neat standards, plus separate source standards for many methods and analytes.

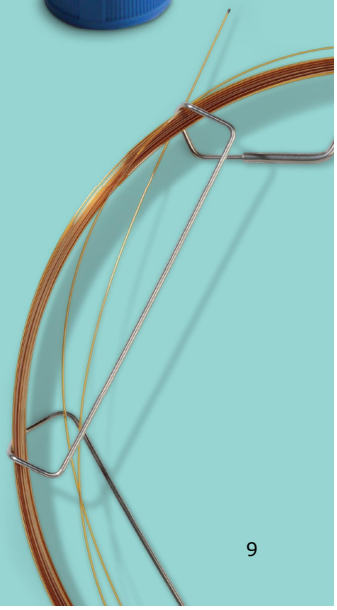
Key Products	Cat. No.
EPA VOC Calibration Kit, 56 analytes, each at 2000 µg/mL in methanol, kit of 6 ampules	**48804**
EPA 8270 Semi-volatile Internal Standard Mix, 6 analytes, each at 2000 µg/mL in dichloromethane, 5 x 1 mL	**CRM5M07296**
Pesticide Surrogate Mix, 2 analytes, each at 200 µg/mL in acetone, 2 mL	**861284**

extensive choice

We offer a wide range of **vials and syringes** suitable for most autosampler models, preparing standards or samples, and short-term or long-term storage. Our portfolio includes clear and amber glass vials, inserts, screw caps, crimp caps, and various septa material. We also supply convenient vial racks for different vial sizes.

Looking for the perfect **GC columns and accessories** for your method? We give you a choice of more than 80 different chemistries and numerous related products. Whether for use with MS, ECD, FID, PID, or ELCD, our GC columns deliver top performance. For optimum results, discover our complete range of GC accessories (molded GC septa, deactivated inlet liners) and gas purification/management products (purifiers, gas generators, tubing, fittings, pressure regulators).

Key Products	Cat. No.
Certified Low Adsorption (LA) Autosampler Vials, 2 mL clear glass with marking spot, screw cap, natural PTFE/silicone septa, pack of 100	**29651-U**
Autosampler Vials, 2 mL clear glass, crimp top, PTFE/red rubber septa, pack of 100	**27239**
VOCOL® Capillary GC Column, 30 m x 0.25 mm I.D., 1.5 µm	**24205-U**
SLB®-5ms Capillary GC Column, 30 m x 0.25 mm I.D., 0.25 µm	**28471-U**
SLB®-35ms Capillary GC Column, 30 m x 0.25 mm I.D., 0.25 µm	**29804-U**
Molded Thermogreen® LB-2 Septa, with injection hold, 11 mm, pack of 50	**28336-U**
Split/Splitless Inlet Liner, 4 mm I.D., single taper wool packed FocusLiner™ design, for Agilent, pack of 5	**2879905-U**



strictly controlled

Inorganic salts, such as sodium sulfate and magnesium sulfate, are used as drying agents. Soil samples are either mixed with the salts before extraction, or extracts are passed through the material prior to cleanup and concentration. EMSURE® inorganic salts are produced under strictly controlled conditions to ensure outstanding analytical purity. This makes them ideal for both qualitative and quantitative analyses. They meet or exceed international standards such as ISO, ACS, and Reag. Ph Eur, and come with an extensive Certificate of Analysis.

Filtration is commonly performed in environmental laboratories using **filter discs.** To serve a wide variety of applications, our portfolio includes filter discs made from glass fiber, quartz fiber, mixed cellulose esters (MCE), nylon, polypropylene, polyvinyl chloride, or polytetrafluoroethylene (PTFE) materials.

We also provide **filtration hardware** for gravity or vacuum driven applications. Glass powder funnels and drying columns are used to securely hold filter discs and inorganic salts when transferring extraction solvents to the Kuderna-Danish concentration apparatus. Large, two-piece polypropylene Buchner funnels and Zero Headspace Extractor (ZHE) devices are designed for the preparation of Toxicity Characteristic Leaching Procedure (TCLP) samples.

Key Products	Cat. No.
EMSURE® Sodium Sulfate, anhydrous, granular, for organic trace analysis, >99%	**106639**
EMSURE® Magnesium Sulfate, anhydrous, for analysis, >98.0%	**106067**
Whatman® Filter Disc, quantitative filter paper, ashless, Grade 41, 150 mm diameter, pack of 100	**WHA1441150**
MF-Millipore™ Filter Disc, membrane filter, mixed cellulose ester, 0.45 µm, 47 mm diameter, pack of 100	**HAWP04700**
Millipore® Filter Disc, glass fiber filter without binder (AP40), 0.7 µm, 90 mm, for TCLP filtration, pack of 100	**AP4009000**
Pyrex® Powder Funnel, glass, pack of 24	**CLS622075**
Sample Cleanup Columns, glass, 30 mL champagne design reservoir, pack of 6	**58099**
Buchner Funnel, two-piece polypropylene, 315 mL capacity, 90 mm	**Z178152**
Zero Headspace Extractor (ZHE)	**YT30090HW**

The indicators on our **pH test strips** are chemically bonded to the cellulose backing, so they do not bleed and contaminate samples. They can remain in the sample indefinitely, ensuring highly accurate measurements – even in weakly buffered solutions. Our innovative transparent pH test strips allow accurate pH readings from cloudy or turbid samples. Simply wipe the back of the strip, and assess the color through the transparent film.

Method-specific

Inorganic acids and bases are used to modify the pH of water samples prior to extraction. This method-specified adjustment helps partition the analytes of interest into the organic solvent during liquid-liquid extraction. EMSURE® reagents are ideal for this purpose as they offer the outstanding purity needed for qualitative and quantitative analysis. Each EMSURE® product meets or exceeds international standards such as ISO, ACS, and Reag. Ph Eur., and comes with an extensive Certificate of Analysis.

Key Products	Cat. No.
MColorpHast™ pH Test Strips, for pH 0-14, box of 100	**109535**
MColorpHast™ pH Test Strips, for pH 0-6.0, box of 100	**109531**
MColorpHast™ pH Test Strips, for pH 5.0-10.0, box of 100	**109533**
MColorpHast™ Transparent pH Test Strips, for turbid solutions, for pH 2-9, box of 100	**109502**
EMSURE® Hydrochloric Acid, 37%	**100317**
EMSURE® Sodium Hydroxide, pellets, ISO reagent, 99%	**106498**

our Multitaskers!

See pages 21-24 for **products used across lab focus areas,** such as matrix material standards, proficiency testing programs, water purification systems, and lab essentials.

reliable results

The right **SPE products and accessories** are essential for precise extraction and cleanup. Our method-specified tubes and disks ensure reliable analyte recovery, and removal of matrix interferences. We also support you with vacuum manifolds and elution racks.

Solid-phase microextraction (SPME) is a solvent-free extraction technique suitable for many environmental methods. As the market leader and key driver of this technique, we offer the most complete line of **SPME fibers and accessories,** as well as applications.

Our complete solution also includes **purge traps and glassware, derivatization reagents,** and **HPLC columns and accessories** needed for extraction, cleanup, and analysis of organic pollutants.

Key Products	Cat. No.
Supelclean™ ENVI™-18 DSK SPE Disks, porous glass fiber filter embedded with C18 modified silica particles, 47 mm, pack of 24	**57171**
Empore™ SPE Disks, for oil & grease, 47 mm, pack of 20	**66887-U**
Supelclean™ ENVI™-Florisil® SPE Tubes, 6 mL glass tube, PTFE frit, 1 g bed, pack of 30	**54095-U**
Supelclean™ ENVI™-Florisil® SPE Tubes, 6 mL polypropylene tube, stainless steel frit, 1 g bed, pack of 30	**57053**
Millipore® Classic Glass Filter Holder, 47 mm, SS screen, perforated silicone stopper, anodized aluminum spring clamp	**XX1004730**
Millipore® Glass Vacuum Filtering Flask, with sidearm, 1 L	**XX1004705**
Visiprep™ DL Vacuum Manifold, disposable liner, 12 port	**57044**
Diazald®, 99%, 25 g	**D28000**
Whatman® Extraction Thimble, standard glass microfiber, 603G glass fiber, 33 x 94 mm, thickness 1.5 mm, pack of 25	**WHA10371042**

GO elemental

Digestion and Analysis of Metals

SigmaAldrich.com/enviro-metals

In sample preparation, pollutants are released into an inorganic acid through a digestion process. This dissolves or strips away the sample matrix, leaving the metal content in a solution that is compatible with instrumentation.

The extract may also require a concentration step to increase method sensitivity. Subsequent analysis is performed using inductively coupled plasma (ICP), atomic adsorption spectroscopy (AAS), or elemental analyzer instrumentation.

Impurities in reagents used for trace metal analysis can compromise measurement accuracy. That's why all our **inorganic reagents** for wet digestion are carefully tested for purity.

- Ultrapur® acids: meet the highest demands for ultra-trace analysis in the ppt range
- Suprapur® acids: extremely low impurities for high-precision analysis in the ppb range
- Omni*Trace* Ultra™ and Omni*Trace*® acids: suitable for ppt and ppb levels, respectively (only available in North America)
- EMSURE® and EMPARTA® acids: ideal for analyses in the ppm and percent ranges, respectively

Produced and analyzed according to ISO/IEC 17025 and ISO Guide 34, our *Trace*CERT® and Certipur® **inorganic elemental standards** are high accuracy solutions for instrument calibration and process validation. We provide a broad portfolio of single and multi-element solutions for ICP and AAS.

Key Products	Cat. No.
Ultrapur Nitric Acid, 60%	**101518**
Omni*Trace* Ultra™ Nitric Acid	**NX0408**
Suprapur® Nitric Acid, 65%	**100441**
Omni*Trace*® Nitric Acid	**NX0407**
EMSURE® Nitric Acid, 65%	**100456**
Suprapur® Hydrochloric Acid, 30%	**100318**
EMSURE® Hydrochloric Acid, 37%	**100317**
Suprapur® Sulfuric Acid, 96%	**100714**
Certipur® Multi-Element ICP Standard Solution, 24 elements, each at 100 mg/L in dilute nitric acid	**109492**
***Trace*CERT® Periodic table mix 1 for ICP,** 33 elements, each at 10 mg/L in dilute nitric acid	**92091**
***Trace*CERT® Copper Standard for ICP-MS,** 1 mg/L in dilute nitric acid	**41621**
***Trace*CERT® Arsenic Standard for AAS,** 1000 mg/L in dilute nitric acid	**39436**

our Multitaskers!

We also supply **accessories,** such as nebulizers, spray chambers, and torches, for many ICP/OES and ICP/MS instrument models.

See pages 21-24 for **products used across lab focus areas,** such as matrix material standards, proficiency testing programs, water purification systems, and lab essentials.

GO classical

Wet (Conventional) Chemistry Techniques

SigmaAldrich.com/enviro-wetchem

Also known as bench chemistry, this field covers a wide variety of techniques, including ion chromatography (IC), spectrophotometry (UV/Vis/IR), colorimetry, titration, distillation, direct read with electrodes, filtration, drying, and weighing. Since automation cannot be applied to some of these procedures, they may be more labor-intensive than other methods.

highest standards

Our ISO/IEC 17025 and ISO Guide 34 accredited sites produce high-quality **wet chemistry standards,** as Certified Reference Materials (CRMs), Reference Materials (RMs), and analytical standards, for most organic and inorganic assays in wet chemistry. We also offer a variety of certified **pH buffer solutions.**

Ion chromatography (IC) is an analytical technique used for separation and quantitation of anions and cations in aqueous samples. We support you in this method with highly pure **IC eluents** that are ideal for achieving the low-ppm levels needed for trace analysis.

Key Products	Cat. No.
Anion Standard Solution, for IC, 6 anions, each at 10.0 mg/Kg	**89886**
Cation Standard Solution, for IC, 5 cations, each at 10.0 mg/Kg	**89316**
COD Standard Solution, CRM, traceable to NIST, 100 mg/L in water	**125029**
Certipur® Potassium Hydrogen Phthalate Standard	**102400**
Total Kjeldahl Nitrogen (TKN) Standard, 1000 mg/L	**TKN1000**
Certipur® Certified pH Buffer Solutions, 30 mL sachets, 10 each level (4.01, 7.00, 10.00), 30 sachets total	**199006**
Certipur® Certified pH 7.00 Buffer Solution	**109407**

unique stability

Titripur® certified **volumetric titration solutions** offer outstanding purity, quality, and reliability. The ready-to-use solutions are traceable to standard reference materials from the National Institute of Standards and Technology (NIST). Many are packaged in our unique Titripac® system. Constructed from a 4 or 10 L hermetically sealed plastic liner in a recyclable box, the design minimizes waste while keeping the solution stable from the first to the last drop.

Key Products	Cat. No.
Hydrochloric Acid, 0.1 N Titripur® volumetric solution, Titripac® packaging	**109060**
Silver Nitrate, 0.1 N Titripur® volumetric solution, Titripac® packaging	**109081**
Sodium Hydroxide, 0.1 N Titripur® volumetric solution, Titripac® packaging	**109141**

simple security

Our **syringe filters** help you filter samples and extracts – quickly, easily, and securely. One great example is our range of Millex® filters for ion chromatography. Their low-binding, low-extractable polytetrafluoroethylene (PTFE) membrane removes particulates from aqueous and mild organic solvents to ensure cleaner IC spectra.

We offer optimal **filter discs** and **crucibles** for the determination of solids (dissolved, settleable, suspended, and total) in water samples. Our **vacuum filtration hardware** includes glass or stainless steel filter holders for 13, 25, 47, or 90 mm discs, glass reservoirs, glass filtration flasks, and vacuum pumps.

Key Products	Cat. No.
Sodium Bicarbonate Concentrate, 0.1 M $NaHCO_3$ in water, eluent for IC	**36486**
Sodium Carbonate Concentrate, 0.1 M Na_2CO_3 in water, eluent for IC	**56169**
Millex®-LCR Syringe Filter, hydrophilic PTFE, 0.45 µm, 25 mm, pack of 1000	**SLCR025NK**
Whatman® Spartan® Syringe Filter, regenerated cellulose, 0.2 µm, 13 mm, pack of 100	**WHA10463100**
MF-Millipore™ Filter Disc, hydrophilic mixed cellulose esters, 0.8 µm, 47 mm, pack of 100	**AAWG04700**
Millipore® Filter Disc, glass fiber without binder, for TDS/TSS, AP40, 0.7 µm, 47 mm, pack of 100	**AP4004700**
Matched-Weight Fluid Contamination Analysis Monitor	**MAWP037PM**
Coors™ Gooch Crucible, porcelain, 25 mL, with perforated bottom	**Z247073**
Whatman® Classic Glass Filter Holder, 47 mm, Stainless Steel	**WHA1960054**
Millipore® Glass Vacuum Filtering Flask, 1 L	**XX1004705**

just prove it

Three key requirements of **spectrophotometry instruments and test kits** are accuracy, simplicity and durability. The Spectroquant® concept offers them all – in one convenient solution. High-quality instruments, over 200 test kits and methods for quantitative analysis of environmental parameters, customized applications, and start-to-finish quality assurance tools. Get all you need for water analysis. And just prove it.

Compact, portable and robust, our **colorimeters** are made for reliable testing on the go. Spectroquant® Move 100 performs over 100 pre-programmed and 35 user-defined methods for drinking water and wastewater analysis. Spectroquant® Move DC provides fast results for five important parameters in disinfection control: chlorine, ozone, chlorine dioxide, cyanuric acid and pH. Both models are dust-tight and waterproof according to IP 68 classification.

Thermoreactors are needed for sample preparation prior to determination of COD, TOC, cadmium, chromium, cyanide, iron, lead, nickel, nitrogen, phosphorus, silver, or zinc. Our versatile Spectroquant® TR 420 thermoreactor allows digestion of up to 24 samples at once.

Key Products	Cat. No.
Spectroquant® Prove 300 UV/VIS Spectrophotometer, 190-320 nm UV, 320-1100 nm VIS, xenon flash lamp, 4 nm spectral bandwidth	**173017**
Chromate Spectroquant® Test Kit, for CrO_4 (0.11-4.46 mg/L) and Cr(VI) (0.05-2.00 mg/L), 25 tests	**114552**
COD Spectroquant® Test Kit, 4.0-40.0 mg/L, 25 tests	**114560**
Sulfate Spectroquant® Test Kit, 5-250 mg/L, 25 tests	**114548**
Spectroquant® Move 100 Colorimeter	**173632**
Spectroquant® Move DC Colorimeter	**173635**
Spectroquant® Thermoreactor TR 420	**171201**

Turbiquant® **turbidimeters** greatly simplify turbidity analysis. They deliver rapid, reliable measurements in the lab or on-site, and can be combined with our non-toxic calibration standards for quick, clear results. Use Turbiquant® 3000 to measure highly turbid or colored samples.

We supply several **meters and electrodes** for various wet chemistry parameters, such as pH and specific conductivity, as well as oxygen measured as biochemical oxygen demand (BOD), carbonaceous biochemical oxygen demand (CBOD), chemical oxygen demand (COD), or dissolved oxygen.

Key Products	Cat. No.
Turbiquant® 3000 IR Turbidimeter, 0.0001–10,000 NTU	**118332**
Bench-top pH Meter, Hanna HI 2210, 110 V	**Z673811**
Bench-top pH Meter, Hanna HI 3220-02, 230 V	**Z673757**
pH Electrode, Hanna HI 1131B, BNC connector	**Z655341**
Dissolved Oxygen Meter, Extech SDL150	**Z741802**

our Multitaskers!

See pages 21-24 for **products used across lab focus areas,** such as matrix material standards, proficiency testing programs, water purification systems, and lab essentials.

GO Micro

Preparation and Analysis of Microbial Organisms

SigmaAldrich.com/enviro-micro

To protect human health, government agencies have developed special methods for collecting, detecting, and quantifying various microorganisms in drinking water. The most common tests are for coliform (total and/or fecal) and *Escherichia coli*.

great performance

Our **microbiological water filtration devices** deliver optimal performance while streamlining your workflow.

- EZ-Fit™ Filtration Unit: disposable, all-in-one, sterilized device with filter holder, membrane filter disc, and funnel
- Microfil® kits: contain sterile Microfil® funnels and sterile EZ-Pak® membrane filter discs, eliminating need for washing and sterilizing after each test
- EZ-Fit™ Manifold: quick-fit connections and filtration head options for EZ-Fit™ Filtration Units and Microfil® funnels; internal areas accessible without tools for easy cleaning
- EZ-Stream™ Vacuum Pump: fluid flows directly through the pump to waste, eliminating need for intermediate waste containers

Key Products	Cat. No.
EZ-Fit™ Filtration Unit, sterile, white gridded MCE, 0.45 µm, with adsorbent pad, 250 mL funnel, individual packaged, pack of 48	**EFHAW250I**
EZ-Fit™ Filtration Unit, sterile, white gridded MCE, 0.45 µm, 100 mL funnel, multipacks, total of 48 units	**EFHAW10MS**
Microfil® Kit, 250 mL funnels, white gridded 0.45 µm 47 mm MCE membrane filter discs, sterile, 150 each	**MZHAWG251**
EZ-Fit™ Manifold, 6-place, for EZ-Fit™ Filtration Units	**EZFITEFUN6**
EZ-Stream™ Vacuum Pump, for liquid transfer, 3.8 to 4.0 L/min	**EZSTREAM1**

rich in culture

Our **coliform test kits** contain all the supplies you need to perform 150 tests: individually-sealed sterile filter discs, sterilized Petri dishes pre-loaded with adsorbent pad discs, and broth media in multiple 2 mL ampules.

Chromogenic and fluorogenic media, such as Chromocult® and Readycult®, incorporate special substrates that can be cleaved by some bacterial enzymes. This releases chromogen or fluorogen, causing a distinct color change around the colony, or fluorescence under UV light. We offer a choice of broth and agar formats.

Other options for **culture media** include a complete portfolio of ready-to-use culture media, dehydrated culture media based on our unique granulation technology, and ready-to-use liquid media in convenient single-test 2 mL ampules.

Vitroids™ and LENTICULE® discs are **microorganism standards** with a certified CFU count. Produced in ISO/IEC 17025 and ISO Guide 34 accredited facilities, these Certified Reference Materials (CRMs) and Reference Materials (RMs) are traceable to validated culture collection strains. Each product consists of pure bacteria or fungi culture in a solid, water soluble matrix that can be re-hydrated in just 10 minutes. Our unique preservation technology ensures stability for up to 3 years.

Key Products	Cat. No.
Total Coliform and *E. coli* Test Kit, 150 tests	**HAWGPDMCB**
Fecal Coliform Test Kit, 150 tests	**HAWGPDP2F**
Chromogenic Media, Chromocult® coliform agar, 500 g	**110426**
Chromogenic Media, Readycult® coliforms 100, 20 snap-packs	**101298**
***Escherichia coli*, WDCM 00012, Vitroids™ certified reference material,** 50-80 CFU mean value range	**VT000122**

big selection

Gridded membrane filters of mixed cellulose esters (MCE) are perfect for collecting microbial organisms in water samples. Our EZ-Pak® Membrane Dispenser Curve provides high-speed, sterile dispensing with no-touch operation.

We offer several **Petri dishes** to suit different needs, as well as **adsorbent pads** that can be loaded into any Petri dish and saturated with media.

- ReadyPlate™ 55 CCA ISO 9308: sterile 55 mm plates pre-filled with Chromocult® coliform agar for enumeration of E. coli and coliform
- Petri-Pad™: sterile Petri dishes pre-loaded with absorbent pads, ready for liquid broth
- PetriSlides™: one-piece dish/base design for easy mounting onto a microscope stage; novel alternative to classic Petri dishes

Our selection of commonly-used **equipment** includes: single- and dual-chamber lab incubators, blunt end stainless steel filter forceps, stereo microscopes, and lab-scale UV sterilizers for decontaminating 47 mm filter holders between samples.

Key Products	Cat. No.
EZ-Pak® Membrane Dispenser Curve, rechargeable battery pack	**EZCURVE01**
EZ-Pak® Membrane Filter Disc, sterile, white gridded MCE, 0.45 µm, 47 mm, 4 cartridges of 150 discs each	**EZHAWG474**
Millipore® Membrane Filter Disc, white gridded MCE, 0.45 µm, 47 mm, pack of 100	**HAWG04700**
S-Pak® Membrane Filter Disc, sterile, white gridded MCE, 0.45 µm, 47 mm, individually sealed, pack of 600	**HAWG047S6**
ReadyPlate™ 55 CCA ISO 9308, sterile pre-filled plates	**146757**
ReadyPlate™ 55 KIT CCA ISO 9308, sterile pre-filled plates and sterile membrane filter discs, 150 tests	**146758**
Petri-Pad™ Petri Dish, sterile, preloaded with 47 mm adsorbent pad discs, pack of 150	**PD20047S0**
PetriSlides™ Dish, sterile, dish preloaded with 47 mm absorbent pad discs, pack of 100	**PDMA04700**
Absorbent Pad, 47 mm disc, pack of 100	**AP1004700**
Jenco™ GL series Stereo Microscope, 115 V, binocular, 7:1 zoom ratio, 6.5-45X, halogen/fluorescent	**Z736511**

our Multitaskers!

See pages 21-24 for **products used across lab focus areas,** such as matrix material standards, proficiency testing programs, water purification systems, and lab essentials.

Matrix Material Standards

go natural

SigmaAldrich.com/
enviro-quality

Be sure of your quality assurance results with our **matrix material standards.** Produced in our ISO/IEC 17025 and ISO Guide 34 accredited facility, every standard is a Certified Reference Material (CRM) consisting of a matrix pre-spiked with certified levels of target analyte(s). We offer various matrices to suit your needs: drinking water, wastewater, seawater, soils, paints, plastic, oil, and transformer oil.

Our **soil matrices** are complex mixtures of the main components of natural soils: soil, clay, loam, sand, and sediment. Each is engineered to replicate the natural conditions of soil maturation. Then we add target analytes in multiple stages before grinding. This proprietary production process results in high-quality soil CRMs that closely resemble real field samples.

certified quality

Key Products	Cat. No.
BTEX/GRO in Sandy Loam, CRM, 30 g	**CRM500**
BNAs in Sandy Soil, CRM, 100 g	**CRM122**
Chlorinated Pesticides in Real Soil Analog, CRM, 50 g	**SQC009**
TPH in Sand, CRM, 100 g	**CRM372**
Trace Metals in Loamy Clay, CRM, 50 g	**CRM052**
Metals in Sewage Sludge, CRM, 30 g	**SQC001S**
Chromium VI in Sandy Loam, CRM, 30 g	**CRM061**
Anions in Loamy Sand, CRM, 50 g	**CRM702**
Nutrients in Real Soil Analog, CRM, 100 g	**SQC014**

Proficiency Testing

GO PRO

SigmaAldrich.com/pt

With over 20 years' experience in proficiency testing (PT), we offer proven products and services to help you demonstrate your lab's expertise. Our **PT studies** cover all major environmental parameters in organic compounds, metals, wet chemistry, and microorganisms.

For each study, you will receive a high-quality PT sample, produced at our ISO/IEC 17025 and ISO/IEC 17043 accredited facility in Laramie, Wyoming (USA). We deliver over 20,000 samples every year to more than 2,500 participants around the world.

Choose from a broad range of US EPA/global PT schemes for:

- WS (Water Supply/Drinking Water)
- WP (Water Pollution/Waste Water)
- LPTP (Solids/Soils/Hazardous Waste)
- AIR (Air)
- PEP (Pharmaceutical)
- MIC (Microbiology)

We also offer several country-specific PTs (DMRQA/WETT), and state-specific Underground Storage Tank (UST) PTs.

Quick-turn studies are similar to scheduled PT schemes, but are available on demand whenever you need them. Laboratory QA departments use these for corrective action, to train new personnel, to validate new methods, or as blind samples for demonstrating analytical competence.

Visit **SigmaAldrich.com/pt** to learn more about:

- PT schemes (parameters, matrices and methodologies)
- PT testing schedules
- Quick-turn studies
- Requesting quotations (RFQ)
- Our online reporting system
- Training videos
- ISO certificates

GO pure Water Purification Systems

MerckMillipore.com/labwater

We supply a broad range of ultrapure (Type 1) and pure (Type 2) **water purification systems** suitable for environmental analysis. For utmost precision, our Milli-Q® systems combine optimized water purification with unique monitoring technologies. Their advanced features include: intelligent RO, patented Elix® EDI technology, A10® TOC monitoring, long-life UV, and polishing cartridges.

Q-POD® and E-POD® water dispensers greatly simplify water delivery, providing essential data and easy operation in compact formats.

- Get the right water quality for your analysis: Each POD is fitted with an Application-Pak that provides final purification to match water quality to your application's needs.
- Streamline your work: Convenient and adaptable handling enables intuitive and precise dispensing. You can either set a specific volume with the autofill key, or manually press the plunger.
- Free up space on your bench: As only the POD is needed for daily work, the system can be conveniently stored under the bench or on the wall.

Several **Application-Paks** are available for removing targeted contaminants at the water dispenser. Examples include: VOC-Pak® Polisher for volatile applications; EDS-Pak® Polisher for semi-volatile and pesticides/PCB applications; and LC-Pak® Polisher for HPLC mobile phase applications.

water at your fingertips

Introducing the NEW Milli-Q® IQ 7000 Ultrapure System

Contact your Account Manager or Lab Water Specialist for more details on this, or any system, to ensure you get the proper system and accessories for your specific application.

Key Products	Cat. No.
Milli-Q® IQ 7000 Water Purification System, feed: Type 2 water, output 2 L/min Type 1 water	**ZIQ7000WW**
Milli-Q® Integral 10 Water Purification System, feed: potable tap water, output: 10 L/hr Type 1/Type 2 water	**ZRXQ010WW**
Elix® Advantage 10 Water Purification System, feed: potable tap water, output: 10 L/hr Type 2 water	**ZRXV010WW**
VOC-Pak® Polisher, for Milli-Q® IQ 7000 Systems	**V0CPAK0A1**
VOC-Pak® Polisher, for Milli-Q® Integral Systems	**V0CPAK001**
EDS-Pak® Polisher, for Milli-Q® IQ 7000 Systems	**EDSPAK0A1**
EDS-Pak® Polisher, for Milli-Q® Integral Systems	**EDSPAK001**
LC-Pak® Polisher, for Milli-Q® IQ 7000 Systems	**LCPAK00A1**
LC-Pak® Polisher, for Milli-Q® Integral Systems	**LCPAK001**

Lab Essentials

GO easy

SigmaAldrich.com/labware

Our high-quality lab essentials are designed to simplify your work, and suitable for numerous environmental applications, such as extraction, digestion, sample preparation, and extract cleanup.

Find all your lab essentials in our comprehensive portfolio:

- **Glassware** and **plastic ware:** separatory funnels, liquid-liquid concentrators, Soxhlet extractors, condensers, beakers, Kuderna-Danish concentrators, titration or distillation equipment
- **Lab tools:** stainless steel spatulas or scoops, Class A pipettes
- **General supplies:** Pasteur pipettes, boiling chips
- **Equipment:** balances, ovens, furnaces, hot plates, stirrers, heating mantles
- **Safety products:** Gloves, glasses, lab coats

it's that simple

With Extran® **cleaning reagents,** you have no residues, no impurities, no harsh chemicals, and no scents. Just pure biodegradable cleaning power. Choose from formulations for manual or automated use.

Quickly cleanup accidental spills of harmful, aggressive, or unpleasant liquids with safe, eco-friendly Chemizorb® **spill kits.** The range includes powder and granule absorbents for general use, and specific formulations for acids, alkalis and mercury.

Key Products	Cat. No.
Pyrex® Economy Squibb Separatory Funnel, 2 L, polyethylene stopper, PTFE stopcock	**CLS64062L**
Lab Spoon, stainless steel, 7.5 inch, one spoon end, one blade end, pack of 6	**Z511455**
Pasteur Pipettes, non-sterile, 5.75 inch (146 mm), standard tip, soda lime	**CLS7095B5X**
Cleaning Reagent, Extran® MA 02, neutral, concentrate, for manual cleaning	**107553**
Cleaning Reagent, Extran® MA 01, alkaline, concentrate, for manual cleaning	**107555**
Safety Carrier for 2.5L glass bottles	**963533**
Spill Kit, Chemizorb® Granules, for general use	**101568**

GO further

Products for the Collection of Water and Solid Samples

SigmaAldrich.com/enviro-collect

Collect water or solid samples wherever you need to. Our application-specific containers and preservatives will keep them perfectly stable throughout transport and storage – in accordance with environmental methods.

Our 40 mL **VOA vials** are built to protect water samples collected for analyzing volatile organic compounds (VOCs). When filled and capped properly, the containers prevent the formation of headspace. You have a choice of clear or amber glass, both pre-cleaned according to US EPA 40 CFR 136 guidelines.

To collect water samples for analyzing non-volatile organic analytes, we offer 32 oz. or 1 L **amber glass bottles.** For metal or wet chemistry analyses, we supply 250 mL to 1 L **high density polyethylene (HDPE) bottles.**

perfectly packed

Collecting soil samples? Our 125 to 250 mL **clear glass jars** are designed with a straight mouth to allow complete removal of contents.

If your water samples require **preservatives,** protect them with our EMSURE® reagents

Our **chlorine test strips** are ideal for field measurements of chlorine, allowing you to quickly determine the right preservative to use in your water sample.

Key Products	Cat. No.
Clear Glass VOA vial, 40 mL, pre-cleaned, white polypropylene screw cap, pack of 72	**23188**
Amber Glass Bottle, wide mouth, 32 oz., white polypropylene cap, PTFE flat liner, pack of 12	**Z250228**
High Density Polyethylene (HDPE) Bottle, wide mouth, 500 mL	**Z187879**
High Density Polyethylene (HDPE) Bottle, wide mouth, 1 L	**Z187887**
Millipore® Fluid Contamination Monitor, 0.8 µm, 37 mm, white, matched weight with pad, for gravimetric particle analysis, pack of 50	**MAWP037PM**
Clear Glass Jars, straight mouth, 250 mL, white polypropylene cap, PTFE flat liner, pack of 12	**Z263451**
Hydrochloric Acid, EMSURE®, 37%	**100317**
Sodium Thiosulfate Pentahydrate, ACS reagent, >99.5%	**217247**
L-Ascorbic Acid, ACS reagent, >99%	**255564**
MQuant™ Chlorine Test Strips, for 0- 20 mg/L chlorine, box of 75	**117925**
MQuant™ Chlorine Test Strips, for 0- 500 mg/L chlorine, box of 100	**117924**

GO higher

Products for the Collection of Air Samples

SigmaAldrich.com/
enviro-collect

Need to collect airborne particulate matter and chemical pollutants? Get the height of quality with our sampling devices and media. They fully comply with international methods for optimal compatibility with target analytes and compound classes.

active sampling

Active sampling devices use a pump to draw air through adsorbent media such as an ORBO tube, thermal tube, filter or impinger. Choose from our broad range of products for physical and chemical pollutants.

Particulates in the air adversely affect human respiratory function. Many methods developed to monitor particulate levels in ambient air involve gravimetric analysis of a membrane filter. We offer a variety of **particulate matter (PM) filters** that support PM2.5 and PM10 methods.

Our **LpDNPH cartridges** are specially developed for capturing carbonyls. They contain high purity silica coated with 2,4-dinitrophenylhydrazine (2,4-DNPH), which converts carbonyls to stable hydrazone derivatives. They are produced in a low-carbonyl environment, and packaged in low-background material.

For sample collection of toxic organic compounds, such as dioxins, pesticides, PCBs, and semi-volatiles, many methods require **polyurethane foam (PUF)** cartridges. We offer several versions with polymeric adsorbent sandwiched between two PUF layers. Our Supelpak™-2 and Supelpak™-2SV adsorbents, made of purified Amberlite® XAD®-2, are specially cleaned and tested for optimal performance.

US EPA Method 0030 specifies the use of **volatile organic sampling train (VOST)** tubes to collect stack gas effluent from hazardous waste incinerators. We offer 1-bed (Tenax®) and 2-bed (Tenax® and charcoal) varieties. Each VOST tube is individually numbered and pre-conditioned. Many of our **thermal desorption tubes** contain our innovative carbon adsorbents. All **solvent desorption tubes** are packed with method-specified adsorbents.

passive sampling

Passive sampling devices allow sample collection without a pump. We offer several compact, economical, and easy-to-use options.

Our FLM™ **fenceline monitoring tubes** are designed specifically for US EPA Method 325. They are intended for the collection and analysis of benzene and other volatile organic compounds (VOCs) at multiple locations around the perimeter, or fenceline, of refineries. The tubes fit PerkinElmer®, Markes, DANI, Shimadzu™, and O-I Analytical thermal desorbers.

Innovative radiello™ **passive/diffusive samplers** have a radial design, which offers a higher capacity and faster sampling rates than traditional passive monitors. Various samplers are offered for different chemical pollutants. The DSD-DNPH sampling device is designed for the collection of carbonyls. SPME Diffusive Sampling Fiber Holders are used to determine the time-weighted average (TWA) concentration of volatile organic compounds (VOCs) in air.

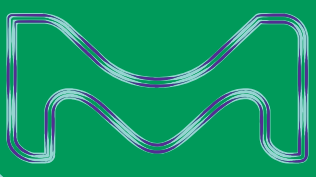
gas sampling

Gas sampling bags and glass bulbs are used to collect whole air samples. Because no media is used, there is no selectivity towards specific analytes or compound classes. Hence, the sample is truly representative of the sampling environment. We offer bags and bulbs in several configurations and sizes.

Key Products	Cat. No.
FLM™ Carbopack™ X Deactivated Stainless Steel Thermal Desorption Tube, preconditioned, pack of 10	**28686-U**
Tedlar® Gas Sampling Bag, 1 L capacity, push/pull lock valve (PLV), pack of 10	**24633**

Key Products	Cat. No.
Millipore® Filter Disc, PTFE membrane discs for PM2.5 monitoring (PTFE with ring), 2 µm, 47 mm, sequential serial numbers, pack of 50	**PM2547050**
Whatman® Filter Disc, PM2.5 air monitoring membrane	**WHA7592104**
Millipore® Filter Disc, quartz fiber disc filter (Type AQFA) for PM10, 47 mm, pack of 100	**AQFA04700**
Millipore® Aerosol Monitor, carbon-filled polypropylene, mixed cellulose esters, 0.8 µm, 25 mm, white with pad, pack of 50	**MAWP025AC**
LpDNPH H300 Cartridge, 20 mL tube, 10 g bed, pack of 20	**505331**
ORBO™ 2500, pre-cleaned large PUF/Amberlite® XAD®-2/PUF media pre-assembled in glass cartridge	**21235-U**
Supelpak™-2SV, purified Amberlite® XAD®-2, 20-60 mesh, 1000 g	**13674-U**
VOST 200 Stack Sampling Tube, contains Tenax® TA:petroleum charcoal, (2:1)	**20075-U**

To learn more about our high-quality solutions
for environmental testing, please visit:
SigmaAldrich.com/enviro



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