Water Purification Solutions for Clinical Analyzers

Simplify seamless performance.

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

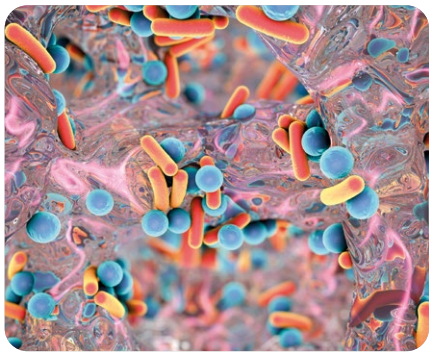
Milli-Q®
Lab Water Solutions

To manage a continuously growing number of tests in a timely manner, clinical labs need to be backed by innovative and reliable technologies.

Secure the performance of clinical analyzers with water purification excellence

Water contamination can interfere with clinical assays, potentially causing errors, unstable results, delays and downtime. **Patented and robust Milli-Q® water purification technologies** ensure that clinical analyzers are fed with water that is contaminant free.

Water purification process	Targeted purification technology
Stage 1. Pure water production	
• Remove large particles, organic compounds, free chlorine	• **Progard®/IPAK Gard® pretreatment cartridges**
• Remove 99% ions, bacteria, particles, organic compounds	• **Advanced reverse osmosis (RO)**
• Remove remaining ions	• **Elix® electrodeionization (EDI)**
• Inactivate bacteria	• **UV lamp**
Stage 2. Storage in the tank	
• Prevent bacterial growth and biofilm formation	• **Automatic Sanitization Module (ASM) with UV lamp**
• Prevent airborne contaminants	• **Vent filter**
Stage 3. Distribution to analyzer	
• Remove ions and organic contaminants to trace levels	• **Q-Gard®/IPAK Quanta® polishing cartridges**
• Prevent contamination of circulating water	• **UV lamp** • **Opticap®/Millipak® 0.22 µm sterilizing filters**

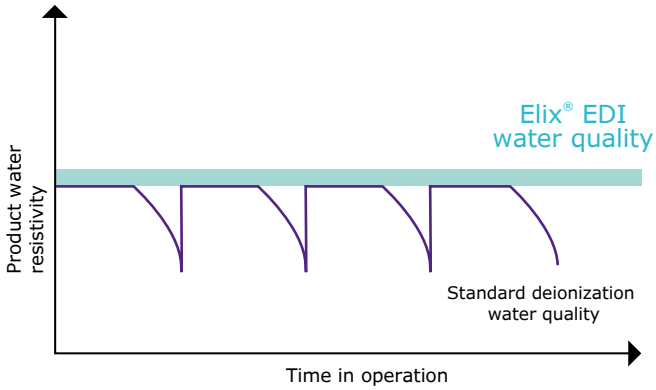


Bacteria and their by-products are a major source of water contamination that can impact clinical assays results. Bacterial contamination can come from tap water and air, resulting in bacterial growth in analyzer reservoirs, tubing and water baths.

Consistent & uninterrupted water quality.

- **Consistent water quality.**
  Despite seasonal and daily variations in tap water that can affect feed water temperature and conductivity, our advanced RO and Elix® EDI technologies produce constant product flow rate and consistent water quality.

  Removing remaining ions from RO water requires deionization (DI) technology. When standard DI water packs are exhausted, resistivity drops dramatically and unpredictably causing unstable results and generating downtime. Our unique, patented Elix® EDI module continuously self-generates its ion-exchange resin, eliminating this risk.
- **Highly reliable systems.**
  Fulfill both daily volume requirements and cover peak-use periods with robust Milli-Q® systems, manufactured in a Merck site that has been ISO 9001:2015 and ISO 14001 certified.
- **Emergency solutions.**
  In case a system is non-operational, the emergency bypass procedure is easy to set up. Available on Milli-Q® CLX 7000 systems.

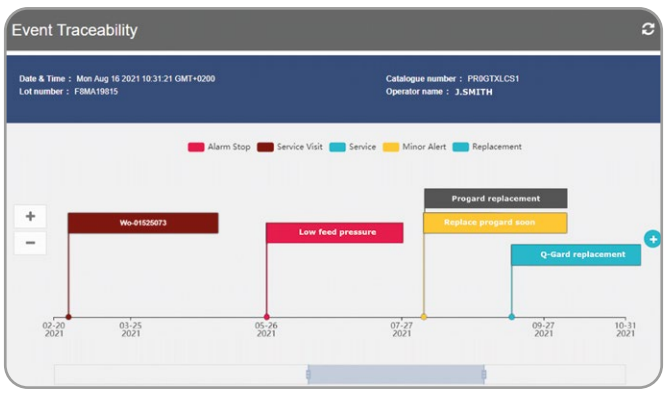


With Elix® EDI technology, deionization quality and cost remain constant, and are independent of feed water quality, RO membrane efficiency, and pure water use.

Total traceability of water quality.

Milli-Q® water purification systems automatically record all water quality parameters, volumes and any system events directly in the system. Events include alerts, setting modifications, purification cartridge replacements, service activities, and more. This is especially critical for clinical laboratories, as water quality must be documented for labs seeking to conform to CLSI® and accreditation (or reaccreditation) to the ISO 15189:2012 standard supported by CAP 15189℠ accreditation.

- **Water quality parameters** (resistivity, temperature, and TOC) are rapidly searchable and graphable over any specified timeline.†
- An **Event Traceability tool**† makes it easy to view events by type and over a specified timeline. Planning for future maintenance is supported as past and future actions are clearly displayed on this interactive MyMilli-Q™ tool.
- **E-record archiving** facilitates accreditation as all data generated are automatically stored in the system memory.



Past and future maintenance actions are clearly displayed on the interactive MyMilli-Q™ Event Traceability tool.

†Available with subscription to MyMilli-Q™ remote services.
CAP, College of American Pathologists; CLSI, Clinical and Laboratory Standards Institute; TOC, total organic carbon.

Fast and simple water system management—any time, anywhere

Maintenance is simplified by digital design.

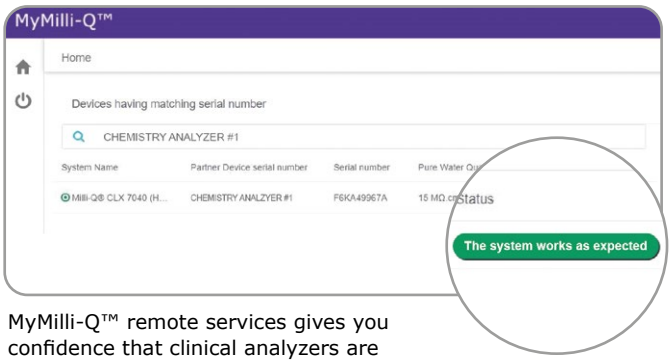
Decreasing the time spent maintaining or monitoring lab water systems can save precious time and stress, and allow greater focus on more important operations and urgencies. Milli-Q® water purifications systems' innovative technologies, designs and digital services contribute to a more efficient working day.

- **Simplified, tutorial-assisted cartridge changes**. There's no need to open the water system to change purification cartridges. System care is rapid and can usually be managed in house following on-screen guides. RFID technology ensures **automatic traceability** of cartridges and prevents the insertion of an incorrect consumable.
- **Walk-away filling**. There's no need to stand in front of the water system to feed a 5- or 10-L analyzer reservoir. *Volumetric Dispense* mode on our patented E-POD® and Q-POD® dispensers fill containers to the set volume.

Quick and easy cartridge changes with our patented pack-locking system and on-screen, step-by-step instructions.

Efficient assistance worldwide with unique digital service capabilities.

- **Fast and remote water system access.**
  MyMilli-Q™ remote services allows for:
  - Secure, real-time monitoring of water system status and water quality data
  - Remote control of water systems
  - Automatic notifications by email or SMS in case of alerts and alarms



MyMilli-Q™ remote services gives you confidence that clinical analyzers are being fed with the correct water quality.

- **Quickly find consolidated, online contract information for all systems in all facilities.**
  The MyMilli-Q™ customer portal simplifies facilities management and remote system care as you'll be able to:
  - Manage consumable deliveries
  - Schedule maintenance visits
  - Renew service plans
  - Streamline audit preparation with rapid access to easily traceable service histories and reports

- **Experience care-free water system operation.**
  Milli-Q® systems require minimal, once-a-year maintenance and are backed by a reliable, reactive and knowledgeable service team in every geography. Preventive maintenance is performed by certified field service engineers who provide user training and following auditable Standard Operating Procedures.

- **Accelerate analyzer troubleshooting**. The MyMilli-Q™ troubleshooting portal helps your Analyzer Hotline and clinical labs to quickly determine a clear water system status for the system feeding your analyzer.*
  - Save time by providing more targeted and faster diagnostics
  - Achieve faster resolution time
  - Reduce interventions in the clinical labs

The Milli-Q® Services hotline is supported by certified field service engineers worldwide who have secure, remote access to connected Milli-Q® water systems.

* Available for Milli-Q® CLX 7000 systems that feed analyzers.

Define and design your total water purification solution in collaboration with our Commercial Engineering and Design team.

Integrate scalability and flexibility into laboratory workflows

Attain optimal laboratory designs with expert advice.

Consult with our water experts for building project management advice that is adapted to local water quality, lab setting and space constraints. Your local Merck team has a depth of engineering and project management capabilities, and can design and customize lab installations to exactly meet the analyzer's requirements.

Analyzer Application	Molecular biology, LC-MS, ICP-MS, HPLC	Histology, Cytology, Microbiology	Hematology, Hemostatis	Immunochemistry, Biochemistry, Modular analyses
Volume	Water required →			
Analyzer feed	Manual		Automated	
Water quality	Ultrapure / Type 1	Pure / Type 2 / CLRW		

Reduce environmental impact of clinical labs

- **Up to 50% water savings.**
  Reject RO water is recycled by E.R.A.® technology, reducing water use up to 50% vs. other RO systems. Recycling RO water also extends the lifetime of pre-treatment cartridges, further reducing waste.
- **Reduced chemical waste.**
  Elix® EDI technology eliminates the need for hazardous chemical regeneration procedures, associated waste, and costly resin cylinders.

Top 1% for Sustainability Management.
We are proactively engaged in reducing the environmental footprint of our products. In 2020 and 2021, Merck KGaA, Darmstadt, Germany was awarded Platinum status from EcoVadis, placing us in the top 1% of all companies assessed.

Bringing the right fit with a portfolio of compact systems.

Our comprehensive range of water purification systems and customizable solutions can be adapted to fit laboratory needs. No matter the size, set up, or quality requirements, solutions are available that produce from a few liters to up to several thousand liters per day of pure, Clinical Laboratory Reagent Water (CLRW), and ultrapure quality water.

Water quality	Feed to analyzer	Max. daily volume	System range	System water specifications
CLRW	Automated	3000 L	Milli-Q® CLX 7000	Resistivity > 15 MΩ·cm @ 25°C Bacteria < 1 cfu/mL TOC < 30 ppb Filtration 0.22 µm
	Automated	300 L	AFS®, AFS® D/E	
Pure (Type 2) water	Automated	9000 L	Milli-Q® HX 7000 SD Milli-Q® HX 7000	Resistivity > 5 MΩ·cm @ 25°C, typically 10-15 Bacteria < 10 cfu/mL(1) TOC < 30 ppb
	Manual[2]	300 L	Milli-Q® IX 7003/05/10/15	
Ultrapure (Type 1) water	Manual[2]	300 L	Milli-Q® IQ 7000/03/05/10/15	Resistivity 18.2 MΩ·cm @ 25°C Bacteria ≤ 0.01 cfu/mL (≤ 10 cfu/L)(3) TOC typically ≤ 5 ppb No particles with size > 0.22 µm(4)

CLRW, clinical laboratory reagent water; TOC, total organic carbon.
1. For Milli-Q® IX, bacteria ≤ 0.01 cfu/mL (≤ 10 cfu/L) with Millipak®, Millipak® Gold or Biopak® filter when installed and used in a laminar flow hood.
2. With semi-automated volumetric dispensing.
3. With Millipak®, Millipak® Gold or Biopak® filter when installed and used in a laminar flow hood.
4. With Millipak® or Millipak® Gold filter.

Milli-Q® IX systems deliver consistent-quality pure (Type 2) water with both manual with semi-automated volumetric dispensing.

Milli-Q® CLX 7000 systems can deliver up to 3000 L/day of CLRW to analyzers by automated feed.

Milli-Q® products are for laboratory use only and are not medical devices.

Milli-Q®

Lab Water Solutions

For more information, please visit our website:

SigmaAldrich.com/LabWater

Lit. No. MK_BR8085EN