Milli-Q®
Lab Water

AFS® 10E / 15E

water purification systems

Incorporating Elix® electrodeionization technology

Economical and reliable water purification systems for analyzers with pure water needs up to 300 L daily



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

MERCK

Economical and reliable water purification systems

For clinical analyzers with pure water needs up to 300 L daily

A reliable, constant source of clinical laboratory reagent water (CLRW) that complies with the CLSI® guideline*	State-of-the-art **Elix® electrodeionization (EDI) technology** is combined with other complementary water purification techniques to provide **consistent water quality** meeting CLRW standards.
Low, predictable running costs	Elix® EDI technology uses permanently self-regenerating ion exchange resins to ensure **predictable running costs**. No resin cylinders to replace also means **lower running costs**.
A system that fulfills accreditation needs (e.g., CAP 15189℠ accreditation to the ISO® 15189:2007 standard)	AFS® 10E/15E systems have full monitoring and automatic water quality archiving capabilities. Up to six months of information can be stored for reliable **traceability, and Millitrack® software** provides easy access to data.
A robust system requiring little maintenance	Patented Elix® technology provides constant quality water without the need for softeners or conditioning cartridges, which means **reduced maintenance** — and less analyzer downtime.
Professional, rapid service	Our systems are backed by a **responsive, professional service organization providing rapid intervention**. Milli-Q® Service Plans offer a range of support, including preventive maintenance visits.
An adaptable configuration that makes optimal use of lab space	AFS® 10E/15E systems have a **small footprint**, allowing installation wherever it's convenient: on the wall, on or under the bench, or on a cart. **Add production capacity** by installing an Elix® system in duplex.
Confidence in your water purification system supplier	As one of the top three R&D investors in the Life Science Tools industry and with **more than 50 years of experience** in water purification systems manufacturing, we are a partner you can count on.

*Clinical and Laboratory Standards Institute, Inc. (CLSI®) guideline: "Preparation and Testing of Reagent Water in the Clinical Laboratory; Approved Guideline – Fourth Edition" (CLSI® C3-A4)

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constant- and reliable-quality clinical laboratory reagent water (CLRW)

In biomedical laboratories, pure water is an essential reagent that is necessary for delivering consistent, high-quality results, maximizing productivity and improving patient outcomes. Different types of contaminants may interfere with biomedical lab analyses and alter test results, which is why our AFS® E systems employ a combination of purification technologies, including state-of-the-art **Elix® electrodeionization (EDI) technology**.

Water produced by AFS® E systems has consistent quality meeting Clinical and Laboratory Standards Institute, Inc. (CLSI®) CLRW standards:

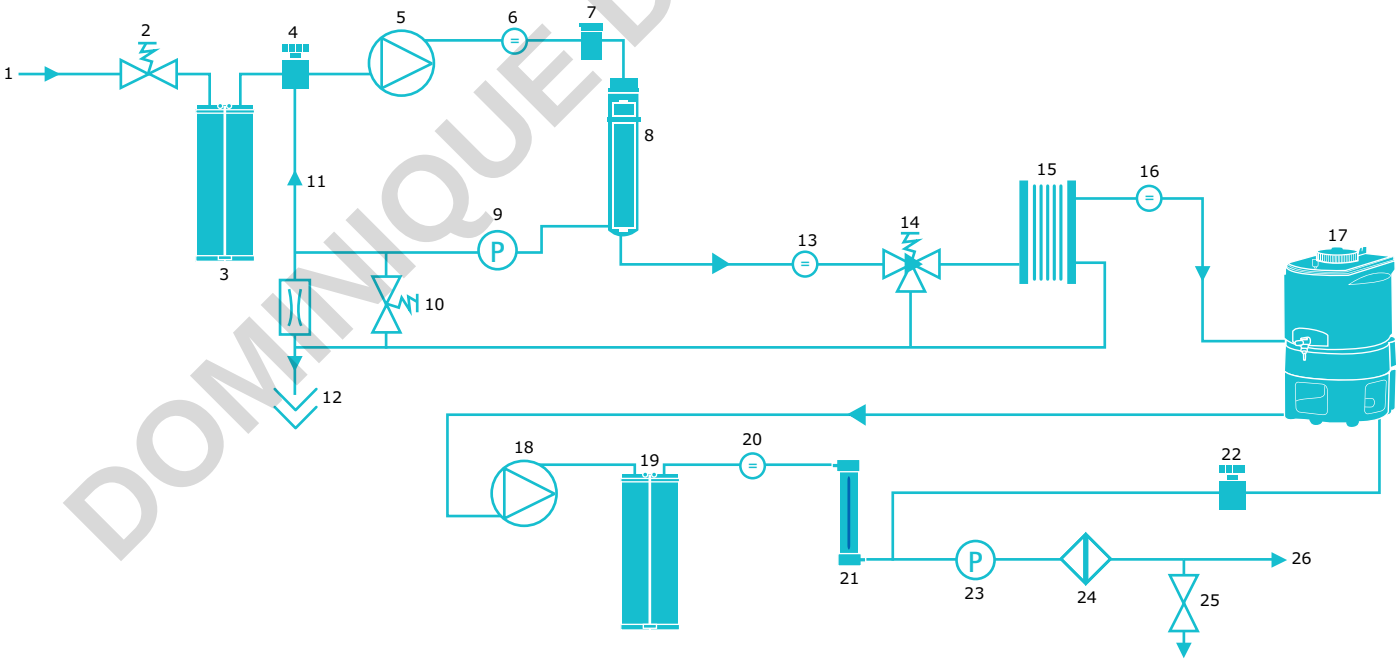
- Resistivity > 10 MΩ·cm @ 25°C
- Bacteria level < 10 cfu/mL
- Total Organic Carbon (TOC) < 500 ppb
- 0.22 µm filtration

Elix® electrodeionization to ensure consistent water quality

In AFS® E systems, potable tap water is first treated with a Progard® pack and purified by advanced reverse osmosis (RO) to remove up to 99% of contaminants. The resulting RO water then enters the Elix® electrodeionization module, where ion-exchange resins are continuously regenerated by a small electrical field. This process requires only very small amounts of water and energy, and results in consistently high-quality pure water—with no need for external chemical regeneration of resin beads, or exchange of resin cartridges. Pure water from the Elix® module is then stored in the AFS® E system's reservoir.

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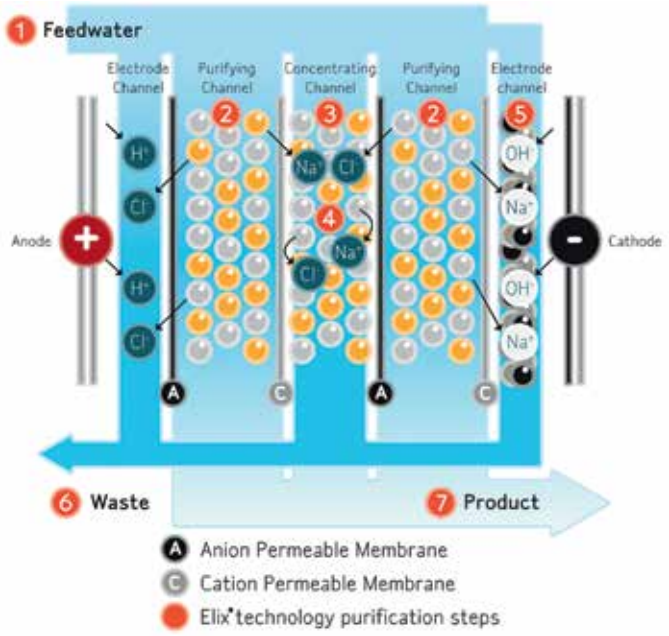
AFS® 10E/15E Systems' Water Purification Pathway



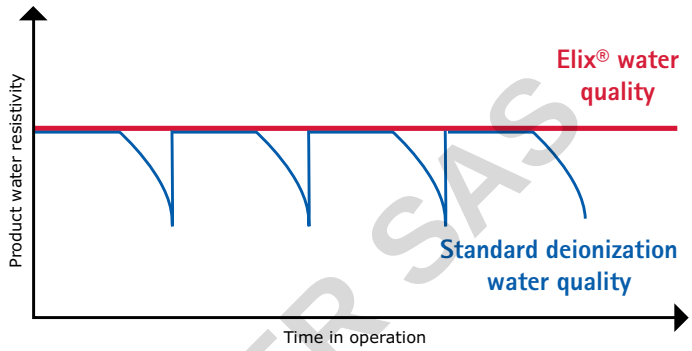
1. *Feed Water*
2. *Inlet Valve*
3. *Progard® Pretreatment Pack*
4. *Pressure Regulator (RO)*
5. *RO Pump*
6. *Feed Water Conductivity Cell*
7. *Sanitization Port*
8. *RO Membrane*
9. *RO Pressure Sensor*
10. *Flush Valve*
11. *Reject Water Recovery Loop*
12. *Reject*
13. *Permeate Conductivity Cell*
14. *Rinsing Valve*
15. *Elix® EDI Module*
16. *EDI Resistivity Cell*
17. *Reservoir*
18. *Distribution Pump*
19. *Q-Gard® Polishing Pack*
20. *Distribution Resistivity Cell*
21. *UV Lamp (254 nm)*
22. *Distribution Pressure Regulator*
23. *Distribution Pressure Sensor*
24. *0.22 µm Final Filter*
25. *Sampling Valve*
26. *Analyzer*

state-of-the-art Elix® EDI technology

Our patented Elix® electrodeionization module is the result of over 25 years of concentrated activity by our Lab Water Research & Development teams. Today, our extensive worldwide-installed base of systems incorporating an Elix® EDI module provides the assurance that Elix® EDI technology is robust, reliable and efficient.



Merck's Elix® module: unique technology based on anion-permeable and cation-permeable membranes, high-quality ion-exchange resin, and activated carbon beads.



The graph clearly shows the superiority of Elix® technology over other systems using ion-exchange resins that must be exchanged or chemically regenerated. Resistivity drops dramatically when packs are exhausted.



Optimized control over water quality for low bacterial levels

To maintain water quality and avoid bacterial buildup in the reservoir, stored water is automatically recirculated through a Q-Gard® polishing pack and a built-in 254 nm bactericidal UV lamp. As a last step, the pure water is sent through a sterilizing-grade filter before entering the analyzer. This helps to limit downtime resulting from analyzer decontamination. Depending on your needs, we offer either a 0.22 µm Opticap® filter to remove particles and bacteria, or a BioPak® C clinical ultrafiltration cartridge that will remove bacterial by-products for alkaline phosphatase-free water.

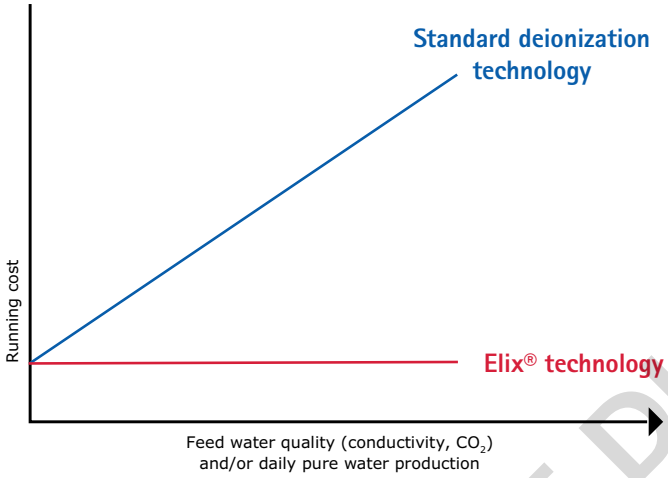
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Low and predictable running costs

Budget-conscious users will appreciate AFS® E systems for their low and predictable running costs:

Patented Elix® electrodeionization technology allows production of pure water without the need for costly resin replacement or regeneration. Water produced by the Elix® module enters the reservoir with a resistivity greater than 5 MΩ·cm @ 25°C (typically up to 15 MΩ·cm @ 25°C)*, which dramatically extends the lifetime of the Q-Gard® polishing pack. As a result, Q-Gard® polishing pack costs are very low.

Water delivered by the Elix® module is of constant quality, independent of the feed water quality, RO membrane efficiency, and volume of pure water used — making it easy to predict the running cost of the AFS® E system.



Running costs for a water purification system using Elix® electrodeionization technology or standard ion–exchange resins that must be exchanged or chemically regenerated: With Elix® Technology, running costs remain constant, and are independent of feed water quality or pure water use.





Advanced AFS® E system design as well as software with automatic self-maintenance functions significantly reduce tap water use and increase cartridge lifetimes:

- The single Progard® pretreatment pack incorporates several purification media that protect the RO membrane from particles, free chlorine and scaling.
- An efficient RO-reject water recovery loop significantly reduces tap water use and helps extend the lifetime of the Progard® pack.
- Automatic self-maintenance functions (i.e., flush mode, sanitization cycles) keep the system's RO membrane in top operating condition.

*When CO_2 dissolved in feed water is less than 30 ppm.

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A water purification system fulfilling accreditation needs

Today, recent significant improvements in quality management systems are leading biomedical laboratories more and more frequently to seek accreditation to the ISO® 15189:2007 standard, which is supported by CAP 15189SM accreditation or by "The Key to Quality" workbook from the CLSI®.*

As the most commonly used fluidic reagent onboard an analyzer, water is a critical reagent, and its quality must be documented. AFS® E systems have full monitoring and automatic water quality archiving capabilities. Up to six months of information is stored for easy and reliable traceability. Optional activation of Millitrack® software provides quick access to this data, as well as enhanced data management control and remote access capabilities.

AFS® E systems check and archive relevant parameters, helping to control proper operation of the system. Risk management and reduced maintenance are achieved thanks to several adjustable set points that can trigger an alarm in case of deviation. Values such as feed pressure, feed water quality, RO pressure, RO water quality and RO membrane efficiency (% ion rejection), etc., can be displayed on the system's LCD display.

*International Organization for Standardization (ISO®); College of American Pathologists (CAP); Clinical and Laboratory Standards Institute, Inc. (CLSI®)

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A low-maintenance, robust system

Low maintenance helps save you time

- Robust and patented Elix® technology provides continuously pure water with no maintenance needed for the Elix® EDI module, or any softeners or conditioning cartridges.
- The ergonomic pack-locking system lets you change AFS® E packs easily and quickly. Just pull up on the locking handle to remove the exhausted pack, position the replacement pack in the cabinet, and push down on the handle to lock the new pack in place—it's as simple as that!
- RFID technology prevents insertion of an incorrect purification cartridge in AFS® E systems, and also ensures traceability of pack use and replacement.

Essential information at a glance

AFS® E systems have been designed for easy, effortless operation. Intuitive controls on the system cabinet simplify use—you see just the information you need, such as product water quality and reservoir water level. When necessary, icons and the system's backlit LCD screen change color to visually inform users of any actions that should be performed.

- Blue display: normal operation
- Yellow display: maintenance needed
- Red display: urgent action required

When there has been no user interaction with the screen for 15 minutes, and there is no alert or alarm, the system's screen saver ("ECO mode") will be activated automatically.

Additional information on system operation and maintenance is provided by the *Quick Reference Guide* and *User Manual* stored on the water production unit.

An adaptable configuration

Optimal use of lab space

With their small footprint, AFS® E systems can be placed wherever it's convenient—on the wall, on or under the bench, or on a cart.



A wide range of storage reservoirs

Select from a wide range of high-quality polyethylene reservoirs (10–350 liters) to match your water usage. Our reservoirs benefit from a number of features that maintain consistent purity of stored water and provide effective protection against airborne contaminants:

- A reservoir vent filter protects water from particulates, bacteria and dissolved CO_2.
- An aseptic overflow function maintains water quality by avoiding retro-contamination from the drain.
- The conical reservoir base allows complete draining and facilitates rinsing during sanitization, while the smooth interior limits biofilm formation.

Systems that can be adapted to your needs

AFS® E systems are available with numerous options, including: an Automatic Sanitization Module (ASM) for further bactericidal protection of stored water; sanitary sampling valve; sanitization kit for full decontamination of the entire system and reservoir; and water sensor.

To add production capacity to your AFS® 10E or 15E system, an Elix® system can be installed in duplex to provide up to 30 L/hour of pure water.

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Professional, rapid service

AFS® E systems are backed by a responsive, professional service organization providing rapid intervention. When Millitrack® software is activated, this can further facilitate a quick diagnostic from the AFS® E system dashboard. An optional emergency backup function can be installed to provide AFS® E customers with temporary coverage until their system is serviced.

Milli-Q® Service Plans offer a range of support, from a single annual checkup to full system coverage. Our certified Field Service Engineers provide expert, professional support for the installation and maintenance of your AFS® E water purification systems, and our technical hotline support experts are available to investigate, diagnose and solve customer issues.

Confidence in your water purification system supplier

As one of the top three R&D investors in the Life Science Tools industry and with more than 50 years of experience in water purification systems manufacturing, we are a partner you can count on. Our long history of collaboration with biomedical laboratories has enabled us to develop our expertise concerning end-user applications such as biology, biochemistry, microbiology and immunology, as well as water contaminants.

AFS® E systems are manufactured in an ISO® 9001- and ISO® 14001-registered site. Additionally, to ensure efficiency and safety of operation, systems are CE-, cUL-, and FCC-certified. Furthermore, to reduce environmental impact, all AFS® E systems follow European Restriction of Hazardous Substances (RoHS) and Waste Electrical and Electronic Equipment (WEEE) directives.

AFS® E System Specifications

System Performance

AFS® 10E and 15E Systems	
Resistivity	> 15 MΩ.cm @ 25°C
Total Organic Carbon (TOC)	Typically < 30 ppb
Bacteria	< 1 cfu/mL
Dissolved silica	< 0.05 mg/L
Dispensing flow rate to analyzer	Up to 2 L/min
Dispensing pressure to analyzer	0.9 – 3 bar (adjustable)
Production flow rate to reservoir	10 L/h (AFS 10E), 15 L/h (AFS 15E)

System Information

Dimensions (H x W x D)	585 x 268 x 426 mm (23 x 10.6 x 16.8 in)
Net weight (shipping box)	24.4 kg (53.8 lb)
Operating weight	28 kg (61.7 lb)
Voltage	100 – 240 VAC
Frequency	50 – 60 Hz
Power consumption	200 W or 250 VA

Feed Water Quality Requirements

Pressure	1 – 6 bar
Flow rate	> 5 L/min at 2 bar
Tap water connection	½ in. Gaz M
Type	Potable
Temperature	5 – 35°C
Conductivity	100 – 2000 µS/cm at 25°C
pH	4 – 10
Langelier Saturation Index (LSI)	< 0.3
Free total chlorine	< 3 ppm
Silt Density Index (SDI)	< 12

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To Place an Order or Receive Technical Assistance

In Europe, please call Customer Service:

France: 0825 045 645
Germany: 069 86798021
Italy: 848 845 645
Spain: 901 516 645 Option 1
Switzerland: 0848 645 645
United Kingdom: 0870 900 4645

For other countries across Europe, please call: +44 (0) 115 943 0840

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MerckMillipore.com/offices

For Technical Service visit:
MerckMillipore.com/techservice

For more information, please visit our website:
MerckMillipore.com/labwater

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