



Selecting the Optimal Water Quality for Histopathology

Water is present in many histology and cytology procedures. It is the main component of many reagents, stains, buffers and rinsing solutions, and is used in instruments present in the laboratory (stainers, tissue processors, etc.). Selecting the appropriate water quality can help to ensure stable and reproducible staining for accurate and reliable results.

Many stains are based on a variety of chemical reactions, such as acid-base chemistry, redox reactions, or enzymatic reactions. Some water contaminants may interfere with these reactions and interactions, altering staining quality in terms of color intensity and specificity, artifact formation and dye stability. In addition, water quality and contaminants can vary seasonally and with geographic location.

- **Ions**, such as calcium and various metals, are known to interfere with a variety of stains (e.g. silver stain), and many stains are sensitive to pH changes (H&E stain, Giemsa stain from MGG stain, Alcian blue). Using pure water with reliably low levels of ions will ensure high quality, reproducible staining.
- **Chlorine**, often present in tap water, can have a bleaching effect on various types of stains, and should not be present in water used to prepare reagents.
- **Bacteria and particulates** may adhere to tissue sections and generate artifacts on slides. Using water free of bacteria and particulates will also help prevent the formation of deposits and biofilm inside strainers, analyzers for immunohistochemistry (IHC) and fluorescence *in situ* hybridization (FISH), and the tubing of some tissue processors, which could alter their function.
- **Organic compounds** may serve as nutrients for bacteria or interfere with some fluorescent dyes, and should be kept to a minimum.

Selecting a reliable source of pure water with low levels of ions (resistivity > 5 MΩ·cm), bacteria, particulates and organics (low TOC) will assist your laboratory in delivering quick and accurate results. Consistent quality pure water from the Milli-Q® IX water purification system can help you obtain optimal, reliable and reproducible histology staining. Plus the system's integrated data management capabilities ensure full traceability and ease your laboratory's quality management tasks.



Advance your Purpose

With the Milli-Q® IX 7003/05/10/15

Pure Water System

Increase Lab Productivity

- Easy to use and maintain
- Smart touchscreen interactions
- Ergonomic dispensing options

Assure quality as you dispense

- Constant, reliable pure water quality
- Continuous quality monitoring
- Pure water quality meets Pharmacopeia and ISO® requirements

Simplify traceability

- Automatic e-record archiving
- Paperless data management
- Support audit preparation



Water quality specifications

Pure, Type 2 water specifications¹

Resistivity at 25 °C ²	>5 MΩ·cm; typically 10–15 MΩ·cm
Conductivity at 25 °C	0.2 µS/cm; typically 0.1 µS/cm
TOC	≤30 ppb
Production flow rate	3 L/h (Milli-Q® IX 7003) 5 L/h (Milli-Q® IX 7005) 10 L/h (Milli-Q® IX 7010) 15 L/h (Milli-Q® IX 7015)

From an E-POD® dispenser with final filter, the following water quality specifications are achieved:¹

Particulates ³	No particles with size >0.22 µm
Bacteria ⁴	≤10 cfu/L
Pyrogens (endotoxins) ⁵	<0.001 EU/mL
RNases ⁶	<1 pg/mL
DNases ⁶	<5 pg/mL
Proteases ⁶	<0.15 µg/mL
Flow rate	Up to 2 L/min



Design that supports your sustainability initiatives.

1. These values are typical and may vary depending on the nature and concentration of contaminants in the feed water.
2. Resistivity can also be displayed non-temperature-compensated as required by USP.
3. With Millipak® or Millipak® Gold filter.
4. With Millipak® or Millipak® Gold filters or Biopak® polisher when installed and used in a laminar flow hood.
5. With Biopak® polisher when installed and used in a laminar flow hood.
6. With Biopak® polisher.

For more information, contact your local Milli-Q® expert or visit SigmaAldrich.com/Milli-Q-IX

