

# Biopak® Polisher

## Ultrafilter for pyrogen-, nuclease- and bacteria-free water at the point of dispense



The Biopak® Polisher is a disposable ultrafiltration cartridge typically used in cell culture, biochemistry or molecular biology applications. It can be installed at the outlet of Milli-Q® water purification systems to produce pyrogen- and nuclease-free ultrapure water for a period of up to three months.

The cartridge is composed of polysulfone hollow fibers in a white ABS housing. The Biopak® ultrafiltration membrane is designed to optimize the rejection of pyrogens, nucleases and bacteria, while maintaining a high flow rate and minimizing the release of ionic and organic materials.

### Key benefits

- Direct connection to all Merck Millipore Type I water systems
- Pyrogen-free water (< 0.001 EU/mL) production
- RNase-free water (< 1 pg/mL) and DNase-free water (< 5 pg/mL) production
- Safe method that eliminates the need to treat water with DEPC
- Bacteria-free water (< 0.1 CFU/mL) production
- Warranty of results within specifications for a minimum of 90 days usage
- Maintenance-free

## PYROGEN REMOVAL

The most common pyrogens are endotoxins, *i.e.*, lipopolysaccharides (LPS) from the walls of Gramnegative bacteria. The LPS have two major parts: a hydrophilic polysaccharide chain with antigenic regions and a hydrophobic lipid group. As the polysaccharide chain is variable in length, the LPS molecular weight ranges from 3,000 to 25,000 Dalton. In ultrapure water, the LPS sub-units aggregate to form higher molecular weight structures that can be removed by ultrafiltration membranes with cut off below 20,000 Dalton.

Pyrogens are known to affect cell culture and biochemistry experiments in numerous ways. It has been demonstrated that their interaction with cell membranes causes morphological changes and damage, as well as the secretion of specific substances such as tumor necrosis factor, cytokines or enzymes. Pyrogens also affect the cell division process (enhancing or reducing it) depending on the nature of the cell line. The presence of pyrogens also may affect analytical techniques such as electrophoresis.

For these reasons, it is good laboratory practice to remove pyrogens from all solutions used in cell culture and other biochemical applications. Experiments performed in Merck Millipore R&D laboratories have demonstrated that the Biopak® Polisher can be used for at least 90 days to treat Milli-Q® ultrapure water and obtain product water with a pyrogen level below 0.001 EU/mL.

## NUCLEASE REMOVAL

Challenge tests performed in Merck Millipore R&D laboratories have demonstrated that the Biopak® cartridge allows easy production of ultrapure water that is both RNase-free (< 1 pg/mL) and DNase-free (< 5 pg/mL).

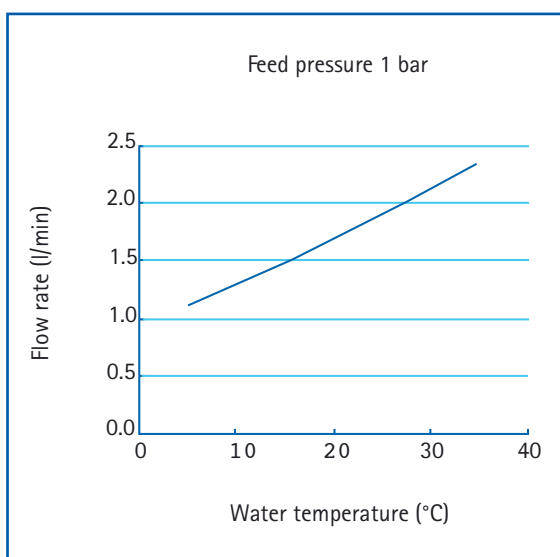
Previous experiments also have shown that ultrafiltration with a properly validated device is just as efficient as diethylpyrocarbonate (DEPC) for RNase removal from ultrapure water without the negative aspects of DEPC treatment: lengthy treatment time and contamination of the treated water by CO<sub>2</sub> and ethanol.



## BACTERIA REMOVAL

The validation protocol provided proof that the Biopak® ultrafiltration cartridge enables delivery of bacteria-free (< 0.1 CFU/mL) water, when used according to instructions with the filter outlet located in a clean environment.

## BIOPAK® POLISHER FLOW RATE



## PRODUCT WATER SPECIFICATIONS

|                       |         |
|-----------------------|---------|
| Pyrogen Level (EU/mL) | < 0.001 |
| RNases (pg/mL)        | < 1     |
| DNases (pg/mL)        | < 5     |
| Bacteria (cfu/mL)     | < 0.1   |

## HIGH FLOW RATE

The large ultrafiltration membrane surface of the Biopak® cartridge makes it possible to produce pyrogen-free ultrapure water without compromising the flow rate, as shown by the graph opposite.

The user can obtain ultrapure water on demand just before solution preparation, minimizing risks of recontamination.

## CERTIFICATE OF QUALITY

Each Biopak® comes with a certificate of quality stating its performance specifications and lot release criteria.

## ORDERING INFORMATION

| Description   | Catalogue No. |
|---|---------------|
| Biopak® Polisher (1/pk), validated for pyrogen-, nuclease- and bacteria-free water production, delivered with a self-adhesive label (with space to note installation and replacement dates), Certificate of Quality and multilingual User manual. | CDUFBI001     |



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