

User Guide

Ultrafiltration Membranes

Introduction

This document is a general guideline for ultrafiltration membrane discs. Please see your stirred cell operating instructions for details on installing the membrane discs into your equipment.

NOTE: A label on the package specifies the membrane type, diameter, lot number, and quantity. When making inquiries, please provide the lot number.

Operating Cautions

- Before sterilizing used membranes with formalin, make sure all residual protein is removed.
- Membrane discs can be used in a cold room, but flow rates will be reduced. Specified maximum operating temperatures are for aqueous solutions only.
- Before introducing solvents to the ultrafiltration cell, check chemical compatibility.
- Reduced recoveries and/or lower filtration rates may signal the need for membrane replacement.
- When separating macrosolutes using membranes with NMWL $\geq 100,000$ kDa, keep the protein concentration at $< 0.5\%$ to achieve maximum resolution.

Operating Procedure

1. Carefully remove white membrane disc from protective package. Handle the membrane disc by its edge only; avoid scratching the glossy surface. The membrane has an inert substrate that improves handling qualities.
2. All membrane discs are pretreated with glycerine to prevent drying. Sodium azide may be added as a preservative when appropriate. To remove these materials before use, rinse each disc by floating it skin (glossy) side down in a beaker of Milli-Q® water for at least one hour, changing water three times. Alternatively, mount membrane disc in an ultrafiltration cell, glossy side toward solution, and rinse by filtering Milli-Q® water for at least five minutes at 379 kPa (55 psi) pressure. Use 69 kPa (10 psi) for membranes with NMWL $\geq 100,000$ kDa. If traces of UV-absorbing material cause interference in a specific experiment, place disc into 5% NaCl for 30 minutes before rinsing, or keep rinsing until there is no more interference.
3. Place the membrane disc into the ultrafiltration device with the skin (glossy) side toward solution.
4. Store discs in a 10% ethanol/water solution and refrigerate.

Filter Material	Regenerated Cellulose Ultracel® PL Series	Polyethersulfone Biomax® PB Series
Sterilization	5% formalin, 70% ethanol, 2% glutaraldehyde, standard sterilizing gas mixture, submerged in buffer, saline or water (at 121 °C, 20 minutes)*	5% formalin, 2% glutaraldehyde, or standard sterilizing gas mixture
Temperature Limit	50 °C (membrane submerged) Specified maximum operating temperatures are for aqueous solutions only.	50 °C
Do Not Use With	Amines, > 10% phosphoric acid, > 0.5% phenol, > 0.01 N hydrochloric acid, solutions with pH < 3.0 or > 13	> 10% phosphoric acid, pure aromatic and chlorinated hydrocarbons, ketones, DMF, M-Pyrol, DMSO, polar aromatics, aliphatic esters
Restoration	Rinse for 30 minutes with either 0.1 M NaOH, 100 ppm NaOCl (at 25 °C), or 0.1–0.5% chemical cleaner (Micro or Tergazyme® cleaners are recommended); then flush membrane thoroughly with distilled or deionized water. For strongly adsorbed proteins, soak membrane in 0.1% protease solution, then rinse thoroughly.	

* Membrane must remain wet and not dry out .

Operating Pressure

Maximum recommended operating pressure is 483 kPa (70 psi). For membranes with NMWL ≥ 100,000 kDa, the maximum recommended pressure is 69 kPa (10 psi). Use the discs at the lowest pressure consistent with the desired ultrafiltrate flow. While higher operating pressure initially improves the flow rate, it also promotes increased concentration polarization and membrane compaction, which ultimately limit flow. With very low NMWL membranes, lower operating pressure may also reduce the retention of salts and very low molecular weight species.

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