

Supor™ EX

GRADE ECV MEMBRANE IN MINI KLEENPAK™ CAPSULES

Supor™ EX grade ECV membrane filters incorporate high-capacity, high-flow rate 0.2 µm sterilizing-grade filter media validated for the retention of *Brevundimonas diminuta* (ATCC 19146) at a challenge level of 10⁷ cfu per cm² membrane.

A polyethersulfone (PES) membrane pairing enables rapid filtration of cell harvest material, process intermediates, growth media, buffers, and final bulk biological process fluids. Supor EX grade ECV membrane filters also perform efficiently with viscous fluids incorporating hyaluronic acid, carboxymethyl cellulose (CMC) or hydroxypropyl cellulose (HPC).

The Mini Kleenpak™ capsule format are the smallest capsule filters in the Supor ECV range to utilize a pleated membrane, suitable for filtration of fluid volumes of 2 to 50 L in process development and in pilot and manufacturing scale operations.



Fig 1. Mini Kleenpak capsules with Supor EX grade ECV membranes.

Features and benefits

Features	Benefits
Minimal hold-up volume	High yield for low-volume GMP manufacture
Small-scale pleated filter capsule	Suitable for scaling trials
Hydrophilic PES membrane	Low adsorptions and wide chemical compatibility
Built-in asymmetric prefilter layer	Long life and low filtration costs

Quality standards

Manufactured for use in conformance with cGMP
ISO 9000-certified quality system
Meets USP Biological Reactivity Test, <i>in vivo</i> , for Class VI-121°C plastics
Every filter element integrity tested during manufacture
Certificate of test: Fabrication integrity
Bacterial retention
Compliance with USP standards for effluent cleanliness
Total organic carbon (TOC)
Water conductivity
pH and pyrogens

Specifications

Materials of construction

Membrane	Hydrophilic polyethersulfone (PES) membrane
Support and drainage layers	Polypropylene
Capsule shell	Polypropylene
Filling bell	Polycarbonate
Sealing technology	Thermal bonding without adhesives

Operating parameters ⁽¹⁾

Maximum operating temperature	40°C
Maximum operating pressure	4.1 bar (60 psi) at 40°C
Maximum differential pressure	4.1 bar (60 psi) at 40°C

⁽¹⁾ In compatible fluids which do not soften, swell or adversely affect the filter or its materials of construction.

Sterilization ⁽²⁾

Autoclave	3 × 60-min cycles at 125°C
Gamma-irradiation	Maximum of 50 kGy

⁽²⁾ Pre-sterilized Mini Kleenpak capsules must not be re-sterilized. Mini Kleenpak capsules must not be sterilized *in situ* by passing steam under pressure. Water wet filter capsules with Supor ECV filter membrane prior to autoclave sterilization to retain full water wettability for integrity testing.

Typical extractables ⁽³⁾

Water at 20°C	< 5 mg per capsule
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⁽³⁾ After irradiation or autoclave sterilization.

Nominal effective filtration area (EFA)

220 cm² (0.24 ft²)

Typical water flow performance

460 mL/min at 100 mbar differential pressure at 20°C

Nominal dimensions

Maximum diameter including valves	53 mm (2.1 in.)
Length – code 2 6 to 13 mm (¼ to ½ in.) hosebarb inlet and outlet connection	105 mm (4.1 in.)
Length – code 8 13 to 19 mm (½ to ¾ in.) sanitary flange inlet and outlet connections	73 mm (2.9 in.)

Ordering information

Description	Pkg	Product code
Mini Kleenpak capsule with Supor EX grade ECV membrane and 6 to 13 mm (¼ to ½ in.) hosebarb inlet and outlet connections. Supplied non-sterile.	3/pkg	KA02ECVP2G
Mini Kleenpak capsule with Supor EX grade ECV membrane and 6 to 13 mm (¼ to ½ in.) hosebarb inlet and outlet connections. Supplied sterile.	3/pkg	KA02ECVP2S
Mini Kleenpak capsule with Supor EX grade ECV membrane and 13 to 19 mm (½ to ¾ in.) sanitary flange inlet and outlet connections. Supplied non-sterile.	3/pkg	KA02ECVP8G
Mini Kleenpak capsule with Supor EX grade ECV membrane and 13 to 19 mm (½ to ¾ in.) sanitary flange inlet and outlet connections. Supplied sterile.	3/pkg	KA02ECVP8S

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