Sartopore Evo® Sterilizing Grade Filter Cartridge

Simplifying Progress

Sustainability Fact Sheet

SARTORIUS

Overview

Sartopore Evo® is the latest generation of high-performance, sterilizing-grade filters for pharmaceutical and biopharmaceutical fluids.

An innovative modification of polyethersulfone (PES) membranes minimizes the adsorption of proteins and excipients such as polysorbates to ensure stable drug formulations and reduce the number of vials that must be discarded during form and fill operations. Unlike the polyvinylidene fluoride (PVDF) membrane filters, Sartopore Evo® does not intentionally use PFAS compounds in its construction material. In addition, Sartopore Evo® filters achieve much higher flow rates and throughputs than PVDF membrane filters, allowing the use of a smaller filter element, further reducing adsorption and disposable waste.

This fact sheet presents the current sustainability status of Sartopore Evo® filter cartridges, using the 10" Sartopore Evo® 0.8 | 0.2 µm sterilizing grade filter cartridge as an example. It highlights our commitment to enhancing the sustainability of our products, with continuous improvements being made over time.

Life Cycle Thinking

At Sartorius, we are committed to sustainability and are actively seeking innovative ways to reduce the ecological footprint of our products.

Adopting life cycle thinking is key to enhancing sustainability and considering the environmental impacts from raw materials to end-of-life disposal. We are dedicated to refining our production methods, boosting efficiency, minimizing waste. We also consider the environmental toll of shipping practices and are committed to optimizing logistics to reduce carbon emissions.

Our ongoing research into materials and designs aims to lessen environmental impact and enhance the recyclability of our products. Guided by Product Carbon Footprint (PCF) screenings, we gain valuable insights that drive the development of more sustainable products and deepen our understanding of their ecological footprints.

Integrating life cycle thinking into our operations not only supports the sustainability of our products but also enables our customers to make environmentally conscious decisions with confidence.

Environmental Overview

Material Selection
All materials of construction are selected with care.
The polymers used for plastic parts and support materials, mainly polypropylene, and the packaging materials, mainly cardboard, are of high quality and largely recyclable.

Raw Material Acquisition
Raw and support materials are supplied from sources close to the manufacturing sites where feasible. Injection molding of plastic parts, membrane production and cartridge assembly are done in close proximity to each other in order to reduce the environmental impact of internal transport.

Material Processing
Membranes, plastic parts and cartridges are manufactured on modern equipment in efficient processes that take material, energy and water consumption into account.
The production sites recycle solvents from membrane manufacturing. Additionally, our site in Goettingen uses 100% renewable electricity.

Certification
The production site for membranes and cartridges in Goettingen, Germany and Yauco, Puerto Rico are certified according to ISO 14001. The environmental management system enables our organization to improve the environmental performance, meet legal and other obligations, and achieve environmental objectives.

Additionally, the production site in Goettingen has received the International Sustainability and Carbon Certification PLUS (ISCC PLUS), a globally recognized certification for recycled, biocircular, and biobased products. This certification enables us to advance toward using bio-circular feedstock at our resin manufacturers, thereby reducing the environmental impact of the plastic components without the need for additional product validation. All manufacturing processes, materials, and components will remain unchanged, maintaining the same technical and performance specifications. This ensures no impact on the fit, form, or function of the final product. In summary, this certification allows us to source products more sustainably and contribute to a circular economy without the need for their revalidation.

Distribution
The production and distribution of the filter cartridges is managed with logistics solutions allowing for minimized impacts linked to transport to the final customers.

Product

Recyclability	78%
Renewable Content	64%

The recyclability of our product stands at 78%, reflecting our commitment to sustainability and environmental responsibility.

Recyclability is defined as the characteristic of products that retain useful physical or chemical properties after serving their original purpose. Once these products are separated and sent to recycling, they can be reintroduced into manufacturing as raw materials[1]. In this context, we refer to the technical recyclability of a material or component, meaning that technological solutions exist to recycle them, either mechanically or through advanced recycling methods.

Additionally, 100% of the polypropylene used in Sartopore Evo® cartridges is made from ISCC PLUS certified bio-circular content. Considering the component's and product's total mass, this results in 64% of the Sartopore Evo® product now containing certified renewable content. The allocation of this renewable content is tracked through a mass-balance approach. All manufacturing processes, materials, and components remain unchanged, ensuring the product continues to meet all technical and performance specifications. As a result, there is no impact on fit, form, or function, and no product revalidation is required.

Complementing this, Sartopore Evo® filters are engineered to function effectively without the intentional use of PFAS.

Elements of the Product: Options at the End-Of-Life

Component	Material	Recyclable
Prefilter Membrane	PES, asymmetric	No
Endfilter Membrane	PES asymmetric	No
Support Fleece	PP (In-line steam sterilizable & autoclavable)	Yes
	PET(γ-irradiatable or γ-irradiatable | autoclavable)	Yes
Core	PP	Yes
End Caps	PP	Yes
Capsule Housing	PP	Yes
O-Ring	Sil (other materials on request)	No

PES: Polyethersulfone, PET: Polyethylene terephthalate, PP: Polypropylene, Sil: Silicone

Definitions: [1]Based on European Environmental Agency GEMET – Environmental thesaurus

Disclaimer
The recyclability of the product may be influenced by its use, such as the presence or absence of agents defined as hazardous, as well as local regulations and the capabilities of local companies to manage those materials. Data refers to the 10" Sartopore Evo® 0.8 | 0.2 µm sterilizing grade filter cartridge (5992507G1).

Packaging

Recyclability	90%
Renewable Content	90%
Recycled Content	48%

Recyclability[1]
Characteristic of products that still have useful physical or chemical properties after serving their original purpose and, after being separated and sent to recycling, can be reintroduced into manufacturing as raw materials.

We refer here as technical recyclability of a material | component | packaging material if technological solutions exist to recycle them (mechanically or via advanced recycling).

Renewable Content[2]
Materials that are derived from resources that are quickly replenished by ecological cycles or agricultural processes, so that the services provided by these and other linked resources are not endangered and remain available for the next generation. In our product packaging we refer specifically to cardboard and paper.

Recycled Content[3]
Proportion of the mass of recycled material on the total mass of the packaging.

Elements of the Primary and Secondary Packaging: Options at the End-Of-Life

Category	Packaging Element	Material	Recyclable?
Plastics	Inner pouch	PE/PA film	No
Paper and Cardboard	Product box & inlay	Corrugated cardboard	Yes
	Product labels	Paper	Yes
	Box labels	Paper	Yes
	Direction for Use & Certificate	Paper	Yes

PA = Polyamide, PE = Polyethylene

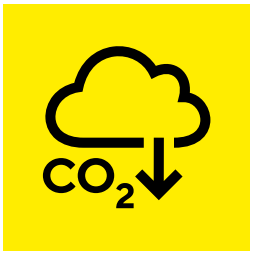
Definitions: [1]Based on European Environmental Agency GEMET – Environmental thesaurus | [2]CSRD | [3]Only recycled post-industrial and recycled post-consumer materials shall be considered as recycled content. The numbers provided herein are the best available approximations.

Disclaimer
The recyclability of the packaging may be influenced by local regulations as well as the capabilities of local companies to manage those materials. Data refers to the 10" Sartopore Evo® 0.8 | 0.2 µm sterilizing grade filter cartridge (5992507G1).

Sustainability at Sartorius

Sartorius is dedicated to shaping a future where improved medicine is more accessible to many. Concurrently, we acknowledge and address the impacts of our operations globally.

Taking into account the concerns of its stakeholders, Sartorius has defined six strategic sustainability topics:



Climate Action

Resources and Circularity

Water and Effluents

Supply Chains

Social Responsibility

Corporate Governance

For further information, visit
sartorius.com/en/company/sustainability

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