



Flexsafe STR® Single-Use Bioreactor Bags

Simplifying Progress



Sustainability Fact Sheet

SARTORIUS

Overview

Flexsafe STR® Single-Use Bioreactors Bags ensure excellent cell growth and robustness combined with advanced single-use, non-invasive monitoring technologies to bring our customer the highest experience level. Discover our product range from 50 L to 2,000 L.

In addition, our Flexsafe STR® bags are engineered to withstand the demands of intensified processes, offering robustness, reliability, and scalability. Process intensification is a key enabler of more sustainable bioprocessing, increasing production efficiency and reducing environmental impact per unit of product. This is achieved primarily through higher productivity and a reduced facility footprint, which in turn lower energy consumption, resource usage, and solid waste.

This fact sheet presents the current sustainability status of Flexsafe STR® bioreactor bags, using the Flexsafe STR® 200 L bag as an example. It highlights our commitment to enhancing the sustainability of our products, with continuous improvements being made over time.

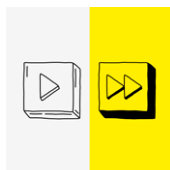
Life Cycle Thinking

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.



**For more information about
Process Intensification, visit**
sartorius.com/process-intensification



Environmental Overview

Material selection

All materials of construction are selected with care. The polymers used in plastic components and support materials, along with packaging materials like 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. Bag manufacturing and final assembly are performed in the same facility, avoiding the environmental impact of internal transport.

Material processing

Bags, tubes and other components are manufactured on modern equipment in efficient processes that take material, energy and water consumption into account. The French production site sends the plastic scraps to external recycling, and use renewable energy to manufacture the bag.

Certification

The production sites for Flexsafe STR® bags in Aubagne, France and Yauco, Puerto Rico, are ISO 14001 certified.

The environmental management system enables our organization to improve the environmental performance, meet legal and other obligations, and achieve environmental objectives.

Distribution

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



Product

Recyclability77%

The recyclability of our product stands at 77%, 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 materials¹. 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.



Elements of the product: Options at the end-of-life

Component	Material	Recyclable
Monomaterial components such as tubing, cable ties	TPE, PA	No
Monomaterial components such as bag, magnets, ports, clamps, plugs, pins, caps, labels, others	PE, LLDPE, LDPE, PP, PC, SS, metals, PET, HDPE, Sil, PBT, paper	Yes
Multimaterial components such as bearings, connectors, sensor body, sparger, others	PEEK, PET, SS, ceramic, ABS, PC, Sil, and others	No

Note. For abbreviations see page 7.

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 one Flexsafe STR® 200 L.

Packaging

Recyclability	99%
Renewable content	45%
Recycled content	45%

As of the publication date of this fact sheet, we have successfully updated the black pigments in the overpouch of the Flexsafe STR® 200 L bags for improved detection in recycling factories. This change, which enhances recyclability, will be applied to all Flexsafe STR® bags by the end of 2026, benefiting both customers and recyclers while aligning with our sustainability goals.

Recyclability¹

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.

In this context, we refer to the technical recyclability of packaging materials, meaning that technological solutions exist to recycle them, either mechanically or through advanced recycling methods.

Renewable content²

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 content³

Proportion of the mass of recycled material on the total mass of the packaging.

Figure 1: Black overpouch image of a Flexsafe STR® 1,000 L bag



Elements of the primary and secondary packaging: Options at the end-of-life

Category	Packaging element	Material	Recyclable
Plastics	Polybag, foam, spacer	LDPE, HDPE	Yes
	Clamp protectors, cable ties	PVC, PA	No
Paper and cardboard	Box	Cardboard, paper	Yes

Note. For abbreviations see page 7.

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

²Corporate Sustainability Reporting Directive (CSRD)

³Only 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 one Flexsafe STR® 200 L. As the Packaging and Packaging Waste Regulation (PPWR) finalizes its method for calculating recyclability, Sartorius is committed to adjusting its practices accordingly to ensure compliance and alignment with regulatory standards.

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 on sustainability, visit
www.sartorius.com/en/company/sustainability

List of Abbreviations

ABS	Acrylonitrile butadiene styrene
AL	Aluminum
CS	Carbon Steel
EPDM	Ethylene propylene diene elastomer
EVA	Ethylene vinyl acetate
ETFE	Ethylenetetrafluoroethylene
EVOH	Ethylene vinyl alcohol
GF	Glass fiber
HDPE	High density polyethylene
LDPE	Low density polyethylene
LLDPE	Linear low density polyethylene
PA	Polyamide
PBT	Polybutylene terephthalate
PC	Polycarbonate
PE	Polyethylene
PEEK	Polyether ether ketone
PES	Polyethersulfone
PET	Polyethylene terephthalate
PP	Polypropylene
PS	Polystyrene
PSU	Polysulfone
PU/PUR	Polyurethane
PVC	Polyvinylchloride
Sil	Silicone
Sil (Pt)	Platinum cured silicone
SS	Stainless steel
TPE	Thermoplastic elastomer

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