Biobased BioProcess Containers

ISCC International Sustainability & Carbon Certification

Introduction

We are committed to designing our products with the environment in mind. This fact sheet provides the rationale behind the environmental claims for the Thermo Scientific™ BioProcess Containers (BPCs) with enrollment in the Thermo Scientific™ Bioproduction Sustain™ Program.

- Low-density polyethylene, used in these products, consists of biobased material from second-generation waste and residue oils under a mass balance approach
- Products are mass balance chain-of-custody certified by the globally recognized International Sustainability and Carbon Certification (ISCC) system
- Incorporating biobased materials decreases the requirement for fossil-fuel materials, hence a reduction in greenhouse gas emissions
- These products use the same Thermo Scientific™ Aegis™ 5-14 and Thermo Scientific™ CX5-14 BPC films that you have trusted for decades, now with a reduced carbon footprint, supported by a carbon accounting framework

Product description

Thermo Scientific BPCs are single-use, flexible container systems constructed with Aegis5-14 or CX5-14 films. They employ a novel design approach, highly valued for its versatility and utility, and are commonly used for sampling, harvesting, handling, storing, and transporting sterile process liquids such as buffers, culture media, and bulk drug precursors and substances. These BPCs are available in a range of sizes and configurations and can also be customized for optimal performance. They comply with CGMP (21 CFR Part 820) and ISO 9001:2000 from the receipt of components to the release of the final product.

Thermo Scientific BioProcess Containers

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Green feature

Less waste/renewable material

The biobased low-density polyethylene resin used in the BPCs is manufactured from a second-generation bio-circular feedstock (waste and residual oils) under a mass balance approach.

Bio-circular feedstocks refer to materials that are considered waste or processing residue at the beginning of the supply chain that are not landfilled or energetically used, but instead reused, further used, or recycled in a loop without dropping out of the economy [1]. These feedstocks have a lower environmental footprint compared to virgin fossil fuel-based feedstocks without sacrificing performance. The chemical identity of polymers derived from bio-circular feedstocks is identical to fossil fuel-based feedstocks, meaning there is no need to re-validate these products.

The ISCC PLUS mass balance approach is used to track bio-circular content and provides a method of verifiable bookkeeping [2,3]. This promotes confidence in traceability through the supply chain and helps enable sourcing of more sustainable products. Thermo Fisher Scientific's Logan, Utah, USA and Cramlington, UK facilities have completed the ISCC certification process, allowing chain-of-custody traceability for the biobased content in the low-density polyethylene resin and resulting BPCs [4].

Incorporating biobased material leads to a decrease in the requirement for virgin fossil-fuel feedstock, thereby resulting in reduced greenhouse gas emissions. Each kilogram (kg) of biobased low-density polyethylene resin used in these products, reduces greenhouse gas emissions by 4.1 kg CO_2e [5]. For example, based on a 2,000 L mAb production workflow with 100 runs/year using Aegis5-14 film, customers have the potential to reduce their carbon footprint by up to 151 metric tons CO_2e [6], which is equivalent to 35.9 gasoline-powered passenger vehicles driven for one year [7]. Transitioning to biobased products can support customers in meeting their Scope 3 emissions reduction targets [8].

By enrolling in the Bioproduction Sustain Program, you will receive the same trusted products, as well as a detailed annual report that quantifies the emissions reduction achieved as a result of your purchases. Maintain the same quality and regulatory compliance of your processes while you implement your sustainability goals.

References

1. ISCC. Feedstock category: Bio-Circular. **iscc-system.org/markets/feedstocks/bio-circular/**
2. ISCC, The Mass Balance Approach. **iscc-system.org/certification/chain-of-custody/mass-balance/**
3. CE100 (Circular Economy 100), Ellen MacArthur Foundation, 2019. Enabling a Circular Economy for Chemicals with a Mass Balance Approach, a Whitepaper from Co.projects Mass Balance.
4. ISCC Certificates, Thermo Fisher Scientific, Life Technologies Corporation, Logan, Utah, United States, and Life Technologies BPD UK Ltd., Cramlington, United Kingdom **iscc-system.org/certification/certificate-database/all-certificates/**
5. Product carbon footprint data provided by the manufacturer of the fossil fuel–based and biobased low-density polyethylene resin used in BioProcess Container film. Fossil fuel–based low-density polyethylene has a cradle-to-gate footprint of 2.6 kg CO_2e/kg of resin. Biobased low-density polyethylene has a footprint of –1.5 kg CO_2e/kg of resin, includes fossil fuel–based emissions, biogenic emissions, and biogenic removals.
6. For demonstration purposes, actual reductions may vary based on BioProcess Container configuration.
7. EPA, Greenhouse Gas Equivalencies Calculator. **epa.gov/energy/greenhouse-gas-equivalencies-calculator**
8. Greenhouse Gas Protocol, Corporate Value Chain (Scope 3) Standard. **ghgprotocol.org/corporate-value-chain-scope-3-standard**

Find out more at
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