PCR plastics, Sustain Series

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 Thermo Scientific™ PCR plastics, Sustain™ Series products.

- Polypropylene used consists of biobased material allocated on a mass balance basis from second-generation waste and residue oils; second-generation feedstock refers to crops, plants, or wastes not suitable for human or animal consumption
- Products are mass balance chain-of-custody certified by the globally recognized International Sustainability and Carbon Certification (ISCC) system

Product description

Thermo Scientific™ PCR plastics, including Sustain Series products (Figure 1), are designed to deliver accurate and reproducible PCR data. These products are manufactured from medical-grade polypropylene in a Class 100,000 cleanroom under ISO 9001 guidelines and are certified to be free from RNase, DNase, PCR inhibitor, and human DNA. Every well of every plate is visually inspected and electrostatically tested for defects and contaminants, and samples from every lot are run through a PCR cycling test to evaluate sealing performance.

Green feature

Less waste/renewable material

The biobased polypropylene resin used in the Thermo Scientific PCR plastics, Sustain Series products 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, which 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. Additionally, there may be no need for revalidation or retesting as the product can be chemically and molecularly identical to an existing fossil fuel–based version.

Figure 1. Thermo Scientific PCR plastics, Sustain Series.

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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 Monterrey, Mexico facility has completed the ISCC certification process, ensuring chain-of-custody traceability for the biobased content in the polypropylene resin and resulting PCR plastics [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 polypropylene resin used in these products reduces greenhouse gas emissions by 3.43 kg CO_2e [5]. This is equivalent to 1.96x lower CO_2e emissions per kg of biobased polypropylene resin compared to traditional fossil fuel–based polypropylene resin. For example, the Thermo Scientific™ 96-well PCR Plate, Low Profile, Full Skirted, Sustain™ Series product has a carbon footprint that is 2.5 kg CO_2e lower than the non–Sustain Series product equivalent. For every 20 units of this product purchased, customers have the potential to eliminate the use of up to 14.6 kg of virgin fossil fuel feedstock and reduce their carbon footprint by up to 50 kg CO_2e. Transitioning to biobased products can support customers in meeting their Scope 3 emission reduction targets [6].

Incorporating biobased plastics into our product designs is a win for our customers, our company, and the planet.

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 the Mass Balance Approach, a Whitepaper from Co.projects Mass Balance.
4. ISCC certificates, Thermo Fisher Scientific, Apodaca, Mexico. **iscc-system.org/certification/certificate-database/all-certificates/**
5. Product carbon footprint data provided by the manufacturer of the biobased polypropylene resin. Fossil-based polypropylene has a cradle-to-gate footprint of 1.75 kg CO_2e/kg of resin. Biobased polypropylene has a footprint of –1.68 kg CO_2e/kg of resin. This includes cradle-to-gate fossil-based emissions (0.96 kg CO_2e/kg), biogenic emissions (0.77 kg CO_2e/kg), and biogenic removals (–3.41 kg CO_2e/kg).
6. Greenhouse Gas Protocol, Corporate Value Chain (Scope 3) Standard. **ghgprotocol.org/corporate-value-chain-scope-3-standard**.

Find out more at **thermofisher.com/sustainplastics**