Nunc Cell Factory systems

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™ Nunc™ Cell Factory™ systems, Nunc™ Standard Closed Cell Factory™ systems, Nunc™ EasyFill™ Cell Factory™ systems, Nunc™ High Density Cell Factory™ systems, and selected custom variations of Nunc™ Cell Factory™ systems with enrollment in the Thermo Scientific™ Bioproduction Sustain™ Program.

- Polystyrene used consists of biobased material allocated on a mass balance basis from second-generation waste and residue oils; second-generation feedstock refers to kitchen waste, used cooking oil, wastes and residues from forestry and forest-based industries, crude tall oil, and straw
- Products are mass balance chain-of-custody certified by the globally recognized International Sustainability and Carbon Certification (ISCC) system

Product description

Nunc Cell Factory systems enable the scale of adherent cells in the manufacturing of vaccines, biologics, and cell therapies with the same growth kinetics as laboratory-scale cell culture products. The ports of the system make it easy to customize and close, with custom tubing assemblies that facilitate venting, filling, and harvesting. Nunc Cell Factory systems are available in 1-, 2-, 4-, 10-, and 40-tray standard versions and 3-, 13-, and 52-layer High Density versions.

Green feature

Less waste/renewable material

The biobased polystyrene resin used in Nunc Cell Factory systems 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 petroleum-based feedstocks, meaning there is no need to revalidate.

Figure 1. Nunc Cell Factory systems.

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 Roskilde, Denmark facility has completed the ISCC certification process, ensuring chain-of-custody traceability for the biobased content in the polystyrene resin and resulting Nunc Cell Factory systems [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 polystyrene resin used in these products reduces greenhouse gas emissions by 3.098 kg CO_2e [5]. For example, for forty 40-tray versions of Nunc Cell Factory systems purchased, customers have the potential to reduce their carbon footprint by up to one metric ton CO_2e. Transitioning to biobased products can support customers in meeting their Scope 3 emission reduction targets [6].

By enrolling in the Bioproduction Sustain Program, you will receive a detailed annual report that quantifies the emissions reduction achieved as a result of your purchases.

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 White Paper from Co.projects Mass Balance.
4. ISCC Certificates, Thermo Fisher Scientific, Nunc A/S, Roskilde, Denmark. **iscc-system.org/certification/certificate-database/all-certificates/**
5. Fossil fuel–based polystyrene cradle-to-gate footprint from Environmental Footprint (EF) 3.1 database, European Commission and Joint Research Center. Polystyrene granulates, production mix, version 18.07.025 (2.325 kg CO_2e / kg of polystyrene granulates). Biobased polystyrene resin product carbon footprint data provided by the manufacturer. Biobased polystyrene has a footprint includes fossil fuel–based emissions, biogenic emissions, and biogenic removals. Exact carbon footprint number available under confidentiality agreement.
6. Greenhouse Gas Protocol, Corporate Value Chain (Scope 3) Standard. **ghgprotocol.org/corporate-value-chain-scope-3-standard**

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