Polymer Add (Thailand) Co.,Ltd.
Office - 106, Chalaremprakiat, Lor 9, Soi 22, Yak 5, Nongbon, Prawet, Bangkok, Thailand 10250
Factory - 188/3, Moo 8, Tambon Bangpu Mai, Amphoe Muang Samut Prakan, Samutprakan, Thailand 10280
Mobile - Thai : 0804531391, English: 0839415475, **E-mail –** contact@polymeradd.co.th

SUCROSE BENZOATE
AS A PLASTICIZER FOR FOOD-CONTACT BIOPOLYESTER FILMS

Sucrose Benzoate is a bio-based aromatic ester derived from sucrose and benzoic acid. In polymer applications, it is best positioned as a specialty solid plasticizer for selected Biopolyester film systems, where food-contact suitability, low migration, thermal stability, and controlled processing are required.Sucrose Benzoate is not a general-purpose plasticizer and must be applied within clearly defined polymer compatibility and processing boundaries.

1. Functional Positioning

Sucrose Benzoate functions as:

- A specialty plasticizer
- A flexibility and toughness modifier
- A low-migration, low-volatility component

It is intended for Biopolyester systems and is not designed for universal replacement of conventional plasticizers across all polymer families.

2. Bio-Based and Non-Phthalate Profile

- Derived from renewable feedstocks using a sucrose-based molecular structure
- Contains no phthalates
- Supports sustainability-driven and compostable packaging development

Suitable for applications where bio-based content and long-term stability are required

3. Food-Contact Regulatory Perspective

Sucrose Benzoate is referenced in the U.S. FDA Code of Federal Regulations under 21 CFR 175.105 (Adhesives) for indirect food-contact applications, subject to the conditions and limitations of that regulation. This reference demonstrates evaluation for regulated indirect food-contact use. Suitability for food-contact biopolyester films must be confirmed through migration testing and final-article compliance, based on formulation and intended use.

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4. Compatible Polymer Systems

- Polylactic Acid (PLA)
- Polybutylene Adipate Terephthalate (PBAT)
- Polybutylene Succinate (PBS)
- PHBV and selected PHA grades
- Aliphatic and aliphatic-aromatic biopolyester blends

These polymers provide sufficient polarity to enable effective plasticization by Sucrose Benzoate under controlled melt processing.

Not Recommended Polymer Systems

- Polyolefins (PE, PP, EVA)
- PVC (all forms)
- Non-polar wax systems

- Highly alkaline or chemically reactive additive systems

In these systems, miscibility or chemical stability is inadequate.

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5. Processing Routes

- Melt compounding of biopolyesters
- Cast film extrusion
- Blown film extrusion within defined thermal limits
- Thermoforming of biopolyester sheets

Processing to Avoid

- Polyolefin extrusion
- PVC processing
- High-shear open systems without melt-temperature control
- Processing beyond defined thermal limits

6. Thermal Processing Window

Parameter	Recommended Range
Typical melt temperature	190–220 °C
Maximum short-term exposure	≤230 °C
Processing to avoid	>240 °C
Residence time	Minimized

Excessive temperature or residence time may result in discoloration, odor formation, or loss of plasticizing efficiency.

7. Performance Characteristics in Biopolyester Films

- Improved flexibility and elongation in rigid biopolyesters such as PLA
- Low volatility, reducing plasticizer loss during processing
- Low migration, supporting food-contact stability
- Neutral odor profile
- Maintained optical clarity in thin films
- It is not designed for extreme softness or low-temperature flexibility.

8. Micronised Solid Plasticizer – Processing Advantage

- Sucrose Benzoate is supplied as a solid plasticizer particle size of D100 < 30 µm.
- Rapid and uniform melt-in during compounding
- Consistent dispersion in Biopolyester matrices
- Accurate gravimetric dosing
- Elimination of liquid pumping, heating, or spill-control systems
- The micronised solid form enables uniform blending and clean handling, particularly in powder-based compounding and masterbatch operations.

9. Typical Dosage Range

Application Type	**Typical Loading**
Flexible Biopolyester films	5–15 wt%

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Highly rigid matrices (e.g., PLA)	Up to 20 wt%, formulation-dependent

Final loading levels should be determined through application-specific trials.

10. Handling and Storage Considerations
Store in dry conditions, preferably below 40% relative humidity
Minimize exposure to open air to prevent moisture uptake
Use sealed or lined packaging for extended storage periods

11. Suitable End-Use Applications
Sucrose Benzoate is suitable for:

- Biodegradable and compostable food-contact films (subject to compliance testing)
- Compostable shopping and produce bags
- Transparent biopolyester packaging films
- Thermoformable biopolyester sheets
- Sustainability-driven packaging products
- It is not intended for structural, high-load, or non-biopolyester applications.

Conclusion
Sucrose Benzoate is a bio-based, non-phthalate, solid plasticizer designed for selected biopolyester film systems. When supplied in micronised form (D100 < 30 µm) and used within defined polymer and processing limits, it offers a combination of low migration, thermal stability, food-contact suitability logic, and clean, uniform processing.Correct application and disciplined processing control are essential to achieving consistent performance.

Disclaimer
The information provided is based on current technical understanding and publicly available data and is offered for general guidance only. Users are responsible for conducting their own trials and regulatory assessments to confirm suitability for specific applications.

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