

POLYSORBATE 65 (TWEEN 65)

E436 Tristearate Stabilizer & Anti-Melting Agent

OVERVIEW

Chemical Nature: Specialized non-ionic surfactant characterized by its Tristearate structure (three stearic acid chains) and ethoxylation.

Appearance: Waxy solid / Yellowish paste. (HLB Value: 10.5)

Primary Application (Frozen Desserts): Preventing Heat Shock. Offers superior fat-destabilization properties. The industry standard for maintaining texture in ice cream and preventing heat shock during storage.

Key Roles: Fat Destabilizer, Foam Control Agent, and Emulsifier.

SPECIFICATIONS

Polysorbate 65 typically appears as a waxy, somewhat viscous solid. It exhibits higher lipophilicity than other polysorbates due to its greater stearic acid content (Tristearate). This makes it suitable for stabilizing emulsions rich in water phase while maintaining compatibility with fats.

| Test Item | Unit | Min | Max |
|----------------------|----------|------|-----|
| HLB Value | - | 10.5 | |
| Saponification Value | mg KOH/g | 88 | 98 |
| Hydroxyl Value | mg KOH/g | 44 | 60 |
| Acid Value | mg KOH/g | - | 2.0 |
| Moisture Content | % | - | 3 |

MOLECULAR STRUCTURE & MECHANISM

- Hydrophilic Segment:** Polyoxyethylene chain introduced through ethylene oxide units (approx. 20), enhancing water affinity.
- Hydrophobic Moiety:** Formed by **three stearic acid residues** (Tristearate) esterified to the core, providing significant lipophilicity.
- Mechanism:** Surface Tension Reduction. The amphiphilic structure allows Polysorbate 65 to adsorb at the oil-water interface. Despite its high stearic acid content, the ethoxylation enables it to act as a reliable O/W emulsifier and stabilizer.

KEY FEATURES

Ultimate Heat Shock Resistance

Unrivalled in protecting ice cream texture against temperature fluctuations. It prevents the formation of coarse ice crystals, keeping the product smooth even after partial thawing and refreezing.

Dryness & Shape Retention

Promotes controlled fat destabilization, creating a 'dry' ice cream extrusion that holds its shape perfectly and resists melting. Crucial for soft-serve and novelty bars.

High-Stability Foam Structure

In whipped toppings, the Tristearate structure creates a robust film around air bubbles, preventing collapse and weeping (syneresis) over time.

Effective Defoaming Action

Uniquely functions as a processing aid to reduce unwanted foam during industrial mixing and fermentation, unlike the high-foaming Tween 20.

APPLICATIONS

- **Frozen Desserts (Ice Cream):** The primary application. Controls fat agglomeration and prevents "heat shock" (ice crystal growth) during storage and transport.
- **Whipped Toppings & Aerated Fillings:** Stabilizes the foam structure in non-dairy whipped creams, ensuring high overrun and stiffness.
- **Bakeries (Cake Mixes):** Used in cake mixes to improve batter aeration and volume.
- **Processing Aid (Anti-Foaming):** Acts as a defoamer during sugar processing and fermentation due to its tristearate structure.

STORAGE & PACKAGING

Storage: Store in a cool, dry, and well-ventilated area, away from direct sunlight and sources of heat. Avoid contact with harmful or incompatible substances.

Transportation: Transport as a general chemical product, following standard safety and handling procedures.

Package Options:

- 25 Kg / drum
- 200 Kg / drum
- 1000 Kg IBC tote