

TOROWHITE FOG 20

In Ice Cream & Frozen Desserts — Melting Control, Texture & Storage Stability (Summary of Advantages)

FOG 20 is TOROWHITE's **natural food-grade calcium sulfate dihydrate ($\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$, E516)**. Calcium sulfate is long documented in ice-cream science as a stabiliser, firming agent and texture modifier, and FOG 20 shares that core chemistry. In frozen dessert systems it acts in the unfrozen **serum phase** — where water mobility governs both texture and melt behaviour — by binding water, raising viscosity and reinforcing the stabiliser network.

Evidence note: the benefits below are established for calcium sulfate in the published literature; FOG 20's specific particle grade is expected to act through the same mechanisms, with performance to be confirmed by direct trial. A bench-scale ice-cream trial is the recommended next step.

What it brings to frozen desserts

- **Melt-rate control** — slows melting and preserves shape and structural integrity during warm-chain distribution and consumption.
- **Firmer, creamier body** — added chew resistance and a drier, stiffer set; especially relevant to soft-serve.
- **Heat-shock resistance** — immobilises melted water during thermal cycling, protecting texture across the cold chain.
- **Finer, more stable ice crystals** — slows the recrystallisation that turns ice cream coarse and icy in storage.
- **Works with your existing stabilisers** — strongest in synergy with common hydrocolloids rather than as a stand-alone.

How it works

Calcium sulfate raises the viscosity of the freeze-concentrated serum phase by absorbing water and acting as a fine particulate filler, **reducing free-water mobility** so the matrix resists melting. As the product hardens and water leaves the serum phase, stabiliser concentration rises and the effect compounds at low temperature. It also reinforces the fat-and-stabiliser network that resists **foam collapse and drip-through** even as ice crystals melt — the mechanism most relevant to commercial meltdown.

Stronger together — stabiliser synergy

Co-stabiliser	Reported synergistic effect with calcium sulfate
Guar gum	Combined thickening; more melt-resistant texture
Locust bean gum (LBG)	Network retards ice recrystallisation; ~40% higher viscosity than LBG alone
Carrageenan	Calcium ions potentiate viscosity and body
Mono- & diglycerides	Support fat stability alongside water management

Where it fits

Soft-serve (dryness and stiffness at dispense); ice-cream sandwiches and novelty formats (shape retention, easier set processing); standard and premium ice cream (body, creaminess, melt resistance); sherbets and ice milk (melt-rate control); and dessert gels (calcium-ion source for alginate systems).

Multifunctional, and cleanly regulated

One natural mineral covers several roles at once — **stabiliser, firming agent, melt-rate controller, thickener and calcium source**. Calcium sulfate is an internationally recognised additive (E516 / INS 516): GRAS in the US and permitted under GMP, accepted under CODEX, and permitted in ice cream and ice-cream mix in Canada up to 0.5%. (Grade-specific labelling ceilings should be confirmed with regulatory affairs before any customer-facing claim.)

Bottom line: FOG 20 offers frozen-dessert makers a natural, food-grade calcium sulfate with a documented toolkit for melt control, firmer creamier texture and heat-shock stability — working in synergy with the gums already in the mix. The science supports the rationale; a bench trial is the fast, low-risk way to prove it in your own formulation.

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