



Concrete Cure Accelerant

Airable Research Lab has synthesized a soy-based cure accelerant for concrete. Cure accelerants reduce the time that it takes for poured concrete to set, which is particularly useful in situations when a quick set is necessary (such as in the winter and in niche areas of the construction industry). Today, the chemical most commonly used for acceleration is calcium chloride, which is efficient and inexpensive, but chloride anions are corrosive to rebar. Alternatives such as nitrite-/nitrate-based compounds are toxic. In addition, these materials have somewhat fragile supply chains.

The combined challenges have motivated industry to consider alternative feedstocks. Airable’s bio-based, renewable compound provides good performance without the corrosion challenges, environmental impacts, or supply chain issues.

THE TECHNOLOGY

Soybean fatty acid is functionalized with amine to provide solubility of the compound in the concrete slurry and to impart accelerated curing.

The Airable team used a penetrometer to test product performance. Three concrete mixtures were tested: one with no accelerant (Control) and two slightly different compounds that include @0.50 wt% soy-based accelerant (Airable 1 and 2). The Airable 1 mixture showed a >25% decrease in cure time.

THE BENEFITS

- >25% decrease in cure time
- Added hydrophobicity
- As much as 82% bio-based
- Non-corrosive to iron
- Less hazardous than today’s commercial alternatives

Penetration Depth vs Time

