

TECH OFFER

## Rapid Relief of Dentine Sensitivity with Amorphous Calcium Phosphate Nanoparticles



### KEY INFORMATION

TECHNOLOGY CATEGORY:

Personal Care - Wellness & Spa

Personal Care - Nutrition & Health Supplements

TECHNOLOGY READINESS LEVEL (TRL): **TRL8**

COUNTRY: **THAILAND**

ID NUMBER: **TO175227**

### OVERVIEW

Dentine sensitivity is a common and painful dental condition that occurs when dentinal tubules are exposed, typically due to enamel erosion or gum recession. These tubules allow external stimuli such as heat, cold, or acidic substances to reach the nerves, causing sharp pain. This discomfort can interfere with daily activities such as eating, drinking, and brushing teeth.

Current treatments can be categorized into chemical agents and physical agents:

- **Chemical Agents:** These include desensitizing toothpastes containing compounds like potassium nitrate and fluoride treatments. Potassium nitrate works by blocking pain signals from reaching the nerves, while fluoride strengthens the enamel to reduce sensitivity. However, both of these treatments require continuous, regular use to maintain their effects, and relief is often temporary. They do not address the root cause of exposed tubules but rather offer symptomatic relief.
- **Physical Agents:** Laser therapy and dental bonding fall under this category. Laser therapy seals the dentinal tubules by using heat, providing immediate relief, but it is costly and requires professional application, limiting its accessibility. Dental

bonding involves covering the exposed dentin with a protective layer, but it may require frequent maintenance and can be expensive.

This technology solution is a new formula for tooth desensitizing gel which addresses the limitations of these current methods. This gel uses amorphous calcium phosphate nanoparticles (ACPNNs) to effectively seal exposed dentinal tubules, offering immediate pain relief after just one application. In addition, it replenishes lost enamel minerals, strengthening the teeth and providing long-term protection. It's easy, at-home application makes it a more accessible and cost-effective solution compared to physical treatments like laser therapy, while offering a more durable alternative to chemical agents like desensitizing toothpaste.

By targeting both the cause and symptoms of dentine sensitivity, this gel presents a significant advancement over traditional treatments, delivering rapid and long-lasting relief.

Ideal collaboration partners in the value chain include dental clinics for product validation, and partnerships with research institutions and universities to further the development and optimization of the technology.

## TECHNOLOGY FEATURES & SPECIFICATIONS

- **Rapid Tubule Occlusion:** The gel's ACPNNs provide 85% occlusion of exposed dentine tubules after a single overnight application, effectively blocking pain signals and delivering immediate relief from sensitivity.
- **Long-Lasting Protection & Enamel Strengthening:** The ACPNNs not only seal the dentine tubules but also replenish enamel minerals, strengthening the tooth structure for long-term protection.
- **Convenient Application:** Designed for overnight, at-home use, the gel provides an easy, time-efficient solution. Unlike traditional treatments that require daily application, this gel delivers sustained relief with less frequent use.

This combination of immediate relief and durable enamel protection makes the gel an effective and accessible solution for those suffering from dentine sensitivity.

## POTENTIAL APPLICATIONS

- **Dental Clinics and Oral Care Industry:** The primary application of this technology is in professional dental treatments for dentine hypersensitivity, providing rapid and long-lasting relief for patients experiencing discomfort due to exposed dentinal tubules.
- **Cosmetic Dentistry:** The desensitizing gel can be incorporated into aftercare products for cosmetic procedures, such as teeth whitening, which often result in increased sensitivity. This helps improve patient comfort post-procedure.
- **Pharmaceutical Industry:** The gel can be developed into over-the-counter (OTC) products for treating tooth sensitivity, offering consumers a quick and effective solution that can be applied easily at home, providing a convenient alternative to more invasive treatments.

## UNIQUE VALUE PROPOSITION

- **Fast relief** with overnight application through 85% dentinal tubule occlusion, reducing sensitivity after just one use.
- **Dual-action formula** seals dentine tubules while replenishing enamel, offering long-term protection against sensitivity and tooth erosion.
- **Cost-effective** alternative to professional treatments like laser therapy or dental bonding.
- **Convenient and easy to use**, providing sustained relief without the need for frequent applications or continuous product use.

This combination of features positions the gel as an effective, accessible solution for managing dentine hypersensitivity with both short-term and long-term benefits.