



ACCELERATED  
MATERIALS

# Z<sup>o</sup>rmour COAT

Low Toxicity Protective Additive



## Create Low Toxicity Coatings with Advanced Antibacterial Nano-ZnO Technology – ZArmour COAT

The production of less toxic yet long lasting coatings presents numerous challenges, especially when it comes to avoiding the use of volatile organic compounds and environmentally harmful additives. Many existing antibacterial and anti-mould additives, while effective, suffer from inherent drawbacks such as a high toxicity, yellowish coloration and odours to both the environment and humans. From a colour management perspective, these additives often fall short of desired aesthetics.

Fortunately, at Accelerated Materials, we harness the power of antibacterial and anti-mould nano-ZnO to offer a superior alternative to harmful organic additives in coatings – **ZArmour COAT**. Our exceptional additive boasts three key characteristics that set it apart:

1. *Excellent Prevention of Bacterial and Fungal Growth:* Our antibacterial nano-ZnO material effectively inhibits the growth of bacteria and fungi, providing long-lasting protection and maintaining the integrity of painted surfaces.

2. *Non-toxic for Humans:* Our formulations are carefully engineered to be non-toxic for human skin contact, ensuring it meets the highest safety standards while delivering exceptional performance. ZnO, in its nano and bulk forms, is recognized globally as a human-safe additive for coatings.

3. *Colour-Safe:* Unlike traditional additives that impart a yellowish hue, our nano-ZnO material exhibits a white to transparent coloration, enabling enhanced colour management and design flexibility.

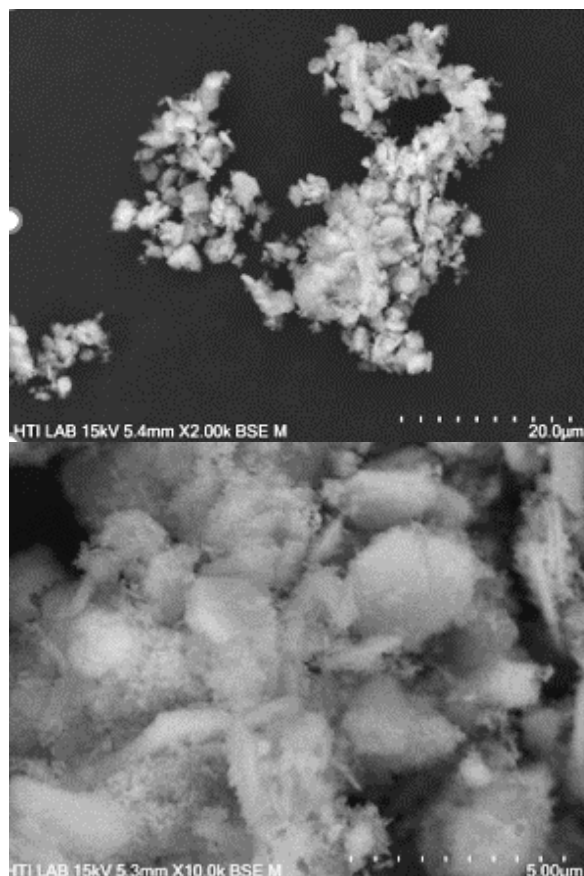


Figure 1. Scanning electron microscopy images of antibacterial ZnO nanoparticles

### Product Overview

Accelerated Materials has recently achieved significant breakthroughs in the cost-efficient synthesis of high-performance antibacterial nano-ZnO at industry scales. Our material can outperform or match industry standards, such as cetrimide, in terms of antibacterial and anti-mould activity.

To cater to specific needs, we provide ZArmour COAT in water-based dispersion, or as a dry powder upon request. We pride ourselves on offering versatile solutions that seamlessly integrate into your paint production processes. Additionally, our dispersions can be formulated without the need for surfactant additives, ensuring a pure and more friendly composition.

For those who wish to create new coating formulations and functionalities with ZArmour COAT, we provide a bespoke product development service, utilizing our in-house expertise in ZnO, coatings and agile R&D workflows. The result of this service is a custom material reaching given specifications.

## Representative Product Specifications

|  |                         |
|--|-------------------------|
| Form   | 5-20 wt% in water       |
| Composition  | ZnO                     |
| Particle size (nm) – DLS                           | <150                    |
| Purity   | >98%                    |
| Recommended amount to water-base latex paint       | 1-2 wt% of paint solids |
| Bacteria growth reduction (according to ISO:22196) | 99.9%                   |
| Colour (L, a*, b*)                                 | 98.3, 0.53, -0.1        |

## Product Data

At Accelerated Materials, we precisely tailor the morphology and size of ZnO, enabling bespoke, optimized solutions for coating products.

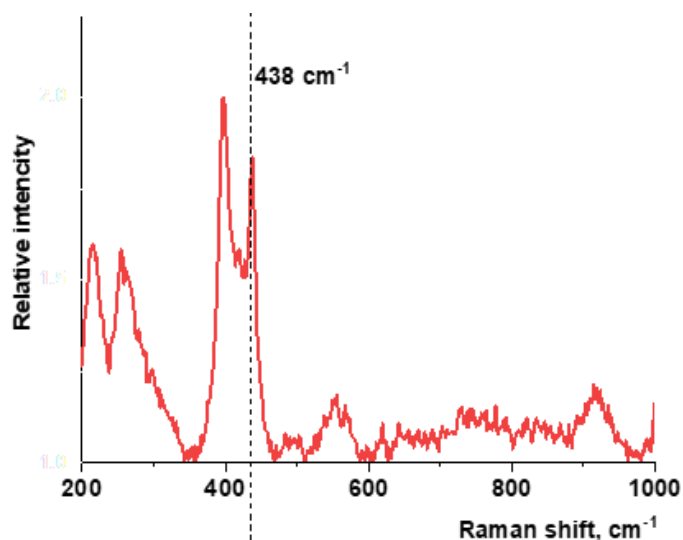
Throughout our research and development process, we maintain high levels of quality by combining both advanced particle characterization tools and microbial testing.

**Figure 1** depicts the characteristic shapes and particle sizes that we determine through scanning electron microscopy.

**Figure 2** showcases the distinctive spectral signature of our antimicrobial ZnO, which we use to validate each batch.

For each formulation we create, we carefully optimize for weight content, ensuring maximum effect with minimum usage, reducing overall cost of using ZArmour COAT.

**Figure 3** features results of our typical antimicrobial assays, which measure an



*Figure 2. Raman spectra for antibacterial ZnO, whose characteristic peak is located at 438 cm<sup>-1</sup>*

“inhibition score” in relation to known industry antimicrobials.

Experience Accelerated Materials’ advanced antibacterial nano-ZnO technology and redefine the possibilities of eco-friendly paints. Join us on our journey towards sustainable innovation, where performance, safety, and aesthetics seamlessly converge. Contact us today at [info@acceleratedmaterials.co.uk](mailto:info@acceleratedmaterials.co.uk) to unlock your next non-toxic coating product.

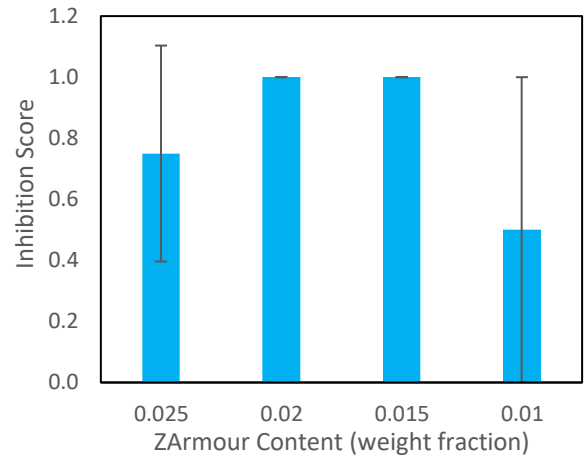


Figure 3. Inhibition score of ZArmour COAT against *E. coli* relative to the amount of additive used.