

## Antimicrobial Varnish: Natural Wood Protection for Enhanced Durability

Technology Domain: Chemistry

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Status (Patent/TRL): Patent Pending / TRL 4

### Technology Summary:

This invention introduces a novel Antimicrobial Varnish Composition designed to protect wooden surfaces, particularly high-value doors, from biological damage and environmental factors. The key technical solution involves a natural, eco-friendly formulation comprising myrrh resin, linseed oil, turpentine, boric acid, and a powerful blend of antimicrobial plant extracts (neem, lemon, cinnamon, clove, jatropa, mango, acacia). A key inventive feature is the incorporation of green-synthesized zinc oxide and iron oxide nanoparticles, which provide superior UV protection, oxidative resistance, and enhanced antimicrobial activity while maintaining transparency or offering optional tinting.

Results from standardized tests confirm its high efficacy against bacteria (e.g., 24 CFU/mL for *E. coli* in suspension tests) and fungi, alongside water and insect resistance, with a shelf-life of 1.5 years. Its primary use is to offer comprehensive, durable, and environmentally safe protection for wooden surfaces, reducing maintenance and extending lifespan.

