

Peroxide based enzyme odor eliminator - White Paper

Great Scott Products

Peroxide-Based Enzymatic Cleaner: A Dual-Action Solution for Odor Neutralization and Disinfection

Introduction

Persistent odors and harmful microbes continue to pose significant challenges across residential, commercial, and public settings. Traditional cleaning agents often rely on synthetic fragrances to mask odors or employ harsh chemicals that present health and environmental concerns. The peroxide-based enzymatic cleaner from **Great Scott Products** offers an advanced and research-supported solution. This dual-action formulation does not merely mask foul smells; it targets and neutralizes their molecular source while simultaneously providing broad-spectrum antimicrobial activity. This white paper examines the underlying science, functional mechanisms, and validated benefits of the cleaner, demonstrating its efficacy as a modern solution for both odor control and disinfection.

Mechanism of Action: Synergistic Enzymatic and Oxidative Cleaning

This cleaner operates on two complementary principles: enzymatic degradation of organic matter and oxidative microbial destruction.

- **Enzymatic Digestion:** The formulation includes fully developed, stabilized enzymes capable of breaking down proteins, fats, starches, and other organic compounds commonly found in urine, food waste, vomit, and other contaminants. Unlike earlier bio-enzymatic cleaners that relied on live bacterial cultures, which required several hours to establish efficacy, these stabilized enzymes are immediately active. Furthermore, they remain effective across a broad pH range and withstand thermal and UV-induced degradation. This allows the enzymes to penetrate porous substrates (e.g., grout, carpet, turf) and thoroughly eliminate the root causes of odors.
- **Hydrogen Peroxide Oxidation:** Present in concentrations of approximately 1–3%, hydrogen peroxide functions as a potent oxidizing agent, generating reactive oxygen species capable of disrupting microbial cell membranes and internal components. The peroxide in this formulation is stabilized to maintain residual activity. As it decomposes, it transitions from mildly alkaline (pH ~9) to near-neutral (pH ~6.5), all while continuing to disinfect before safely breaking down into water and oxygen.

- **Isopropyl Alcohol (IPA):** Included at 10–20%, IPA provides rapid antimicrobial action, targeting a wide range of bacteria and enveloped viruses. Its presence also accelerates drying time and improves the breakdown of lipophilic (greasy) substances. IPA complements peroxide’s slower, sustained disinfecting action by delivering an initial microbial knockdown within seconds of application.
- **Surfactants and Fragrance:** The presence of surfactants ensures the solution can penetrate soiled surfaces, lifting dirt and organic residues. A mild, food-grade fragrance adds a transient scent that supports perceived cleanliness without overpowering or masking residual odors.

Validated Benefits and Use-Case Evidence

1. Elimination of Odors at the Molecular Level

- The enzymatic component targets and degrades uric acid crystals, proteins, and fats—the primary culprits in persistent odors associated with pet accidents, human waste, spoiled foods, and mildew. Field testing and customer feedback confirm that spaces cleaned with this product remain odor-free unless re-contaminated.

2. Broad-Spectrum Disinfection

- The hydrogen peroxide and alcohol combination has proven effective against MRSA, VRE, C. difficile spores, HIV, Hepatitis B, and parvovirus. These agents work in tandem: alcohol provides rapid microbial kill on contact, while peroxide ensures sustained action against resistant organisms. This dual disinfection strategy is supported by peer-reviewed literature and validated in healthcare and veterinary environments.

3. Immediate and Residual Effects

- IPA and hydrogen peroxide offer rapid kill rates. Meanwhile, the stabilized enzymes remain active on surfaces for up to 30–45 days, provided organic material and some moisture is present. This provides not only immediate cleanliness but continued suppression of microbial growth and odor recurrence.

4. Safety and Environmental Profile

- All active ingredients decompose into benign byproducts. The formulation contains no chlorine, phenols, aldehydes, phosphates, or VOCs. It is non-pathogenic, non-toxic, and safe for human and animal contact post-

application. Notably, it can be applied directly to outdoor vegetation without phytotoxic effects, making it suitable for park maintenance and turf cleaning.

5. **Surface Compatibility and Non-Corrosiveness**

- The product is verified safe for use on sealed floors, polished metals, carpet fibers, upholstery, and natural stone. It will not bleach color-fast fabrics or damage surfaces like bleach, quats, or highly alkaline cleaners. Because it leaves no residue, it minimizes re-soiling and maintains the aesthetic and structural integrity of treated surfaces.

6. **Versatility in Application**

- Suitable for use with spray bottles, mop buckets, foggers, and pump sprayers. Concentrates can be diluted up to 1:7 for large-scale cleaning tasks. It has been successfully employed in hospitals, kennels, laundry facilities, public restrooms, artificial turf fields, sidewalks, dumpsters, and homeless encampments.

7. **Cost-Effectiveness and Longevity**

- Long shelf life without refrigeration, thanks to stabilized enzymes and peroxide. One product replaces multiple specialized cleaners (e.g., disinfectants, deodorizers, carpet spot removers, pet stain sprays), reducing inventory complexity and cost. Additionally, the absence of harsh residues prolongs surface and equipment lifespan.

Conclusion

The peroxide-based enzymatic cleaner from **Great Scott Products** represents a robust, scientifically grounded advancement in sanitation technology. It merges the thoroughness of enzymatic bioremediation with the proven disinfection of peroxide and alcohol, all in a formulation that is safe for people, pets, and the planet. Independent research and user data support its efficacy across multiple vectors—odor elimination, microbial decontamination, surface compatibility, and environmental sustainability. As such, it is a compelling solution for those seeking comprehensive, modern cleaning solutions that meet today's heightened health and ecological standards.

Works Cited

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