OxiScience Product Sheet: Disposable healthcare textile products with powerful antimicrobial and odor control performance

Dr. Jeffrey F.Williams, CTO, OxiScience, LLC

Summary: OxiScience LLC has developed unique, patented water-based formulations of Cl-binding heterocyclic compounds for use on both hard and soft surfaces (US patents #10,028,482, US#10, 131,731, 2018*). The formulations combine N-halamine structures with surface-binding compounds. **The products confer powerful antimicrobial and odor-control properties on treated surfaces that persists for many months upon drying, even after single applications.** Simple treatment (soak and dry) of woven or nonwoven textile materials in this way is compatible with current conventional manufacturing processes. It enables ready production of commonplace disposable healthcare items, such as face masks, wound dressings, single-use compression bandages, incontinence devices, etc., with unprecedented effectiveness in protecting against all germ types, and in degrading foul odors.

OxiScience "Surface Coating" technology for textiles:

Our water-based compositions incorporate monochlorinated heterocyclic compounds in a modified cellulose matrix, along with chemical 'scavengers' that stabilize the long-term power of oxidative chlorine. Textile fibers exposed to these formulations acquire a stable, molecular coating that: a) potently and rapidly attacks all germs;b) **degrades malodors directly; and c) inactivates enzymes used by bacteria and fungi to make malodorous products**. Simple soak and dry procedures, with no requirement for high heat curing, cost-effectively confer these properties on both natural and synthetic fibers and blends.

Products made by conversion of these rolled goods into disposable items routinely used in medical settings can provide these benefits, differentiating each from traditional marketplace offerings. Those either lack such functions altogether, or if they have properties of similar nature, are either prohibitively expensive, have only mediocre efficacy, and/or make use of incorporated chemicals with many undesirable characteristics (e.g., nanosilver, PHMB, elemental copper, triclosan).

The coatings laid down in the OxiScience process allow for disposal through normal channels, with end-stage biodegradation of all the components in the environment. The coatings show no tendency to irritate or sensitize on contact, and are stable for prolonged storage and transportation of end products.

Odor control in healthcare:

Opportunities for utility of the odor control effectiveness of disposable textile products in healthcare cover a wide span. For example, simple disposable masks may offer variable degrees of protection against airborne particles, but have no capacity to remove vaporous foul odors; they pass on through the porous filter media. When the fibrous layered components have an OxiScience coating the malodorous chemicals are instantly attacked and degraded, providing the wearer with high level protection against odors that can be both offensive and dangerous.

Healthcare personnel dealing with chronic non-healing wounds, such as those frequently seen in diabetics, are particularly likely to be exposed to malodors in this way. The patients themselves are subject to the emanation of foul odors from chronic wounds that can be nauseating, socially embarassing, and often lead to isolation and immobilization. **Wound dressings that degrade odors as they percolate through the woven mass can change the course of wound management to the benefit of caregiver and patients both**. **OxiScience cotton dressings have been shown to provide this outcome in hospitalized patients in Seattle, WA** and are currently being evaluated for this use in the National Wound Care Center, University Hospital, Cardiff, Wales.

Personal care devices, including those addressing **incontinence**, can be treated to provide much needed control of **urinary odor** in particular. Disposable protective devices aimed at **bed mattresses** can also mitigate the axxociated malodor problems. Studies on the effectiveness of OxiScience coatings on urinary malodors have been conducted by scientists at the **Universiry of Washington**, and will be published to support the efficacy claims. **Data on the findings are available on request.**

Antimicrobial functions for disposable textiles:

Disposable face protection masks with built-in ariborne germ protection have been long sought but appropriate technology to bring this advantage to users **cost-effectively has been lacking until now. OxiScience coatings can now change this situation, putting potent, safe viral inactivating coatings** onto the commonplace nonwoven matrix used in these devices. Oxidation reactions on contact will **rapidly kill bacteria and inactivate viruses, protecting users and ensuring the safety of discarded masks.**

A variety of wound dressing chemistries have been developed in recent years integrating antimicrobial components, particularly **silver**, PHMB, and chlorhexidine, providing some measure of local beneficial reduction in microbial loads. **None of these combines the efficacies of OxiScience coatings in the speed and power of their antimicrobial effects, the odor controlling advantages of instant volatile malodor degradation, and the inactivation of toxic enzymes released into the wound by microbes**. In addition, local oxidative events triggered by these coatings can be a major contributor to enhanced healing, providing a constellation of benefits in wound management that has no equal.

Disposable personal care items that bring antimicrobial benefits, particularly to mucosal membranes subject to **yeast infections**, also become possible with the advent of these novel fiber coatings. Disposable protective garments can be produced with built-in inactivating power on exposure to infectious agents, and single-use devices, such as **compression hosiery,** can be prepared using the technology to great effect, **both for infection control and odor mitigation.**

Conclusion: OxiScience surface modifying formulations offer a powerful new tool for powerful, rapid, control of germ contamination on soft surfaces, and the malodorous products of microbial growth. Manufacturing practices for disposable healthcare textile products can be readily tailored to create these unique outcomes, unmatched by any existing technologies. Opportunities for healthcare applications are numerous, and the product range can provide highly competitive

differentiation at low cost. The technology opens up transformative change potentials in healthcare practices.

*US Patent office recently approved another OxiScience patent, application # 15/872,617, to be granted in Q4 2019

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