

## Sentry BioLOC Antimicrobial Additive

### Preventing the spread of disease at point of contact

Sentry Molecular Coatings chemists have formulated coatings that are not only environmentally friendly with low VOC's, but which also perform above and beyond the current worldwide standards. We have known for years that the technology used by manufacturers in traditional coatings has gone as far as possible with the lower VOC limits that have been imposed on them by the EPA. It is now the time for the next generation of coatings to provide 21<sup>st</sup> century levels of asset protection. Sentry has faced this challenge and is uniquely positioned with proven technology that provides multi-level performance and protection to virtually any surface along with that added benefit to limit the spread of disease at point of contact.

Sentry is fast- establishing itself as the global leader in the new dawn of molecular nano technology coatings. Sentry's commitment is to protect every surface from corrosion and the damaging effects of virtually every environmental condition. Along with this, Sentry's technology now allows you to opt for choosing the coatings with BioLOC to suppress the spread of illness and disease by eliminating bacteria growth on the coated surface.

BioLOC is registered for use by the EPA, FDA, NSF and EFSA, and its performance has been verified through industry- accepted test methods including JIS Z 2801. Sentry's extremely durable coatings with BioLOC added option will provide long- lasting treatment to almost any surface including painted walls, school desks, shopping cart handles, doorknobs, countertops, floors, and medical devices. Initial testing has shown over 99% efficacy in eliminating Escherichia coli and Staphylococcus aureus within 24 hours.

#### Benefits of BioLOC

- Retards microbial growth after coating the surface
- Thin film coating with little visual change to surface appearance
- Low VOC coating with FDA approved safe components
- Compatible with coating over most surfaces and finishes
- High durability test results on abrasion & wear cycles.

#### Why BioLOC

BioLOC is an additive with a history that is completely proven and tested; it is compatible with our molecular coating technology without compromise. This added benefit to Sentry's coatings will help our customers by limiting the transmission of germs that cause disease. Specifying Sentry's antimicrobial coatings as part of your facility's multidisciplinary infection control program will greatly reduce your exposure risks plus provide the added benefit of asset protection from outside factors which won't breach through the coating.

## Nanotechnology Overview

Nanotechnology is simply defined as the science and study of unique properties of matter that occur at the nanoscale (lengths of 1 to 100 nanometers or one billionth of a meter in a least one dimension). The application of nanoscience is called nanotechnology.

The process of the design uses fundamental control over the physical and chemical attributes of molecular-scale structures; and those structures can be combined to form larger structures.

Since the properties of matter depend in part on size, the physical, chemical and biological properties of matter generally differ at the nanoscale level when compared to larger quantities of the same material. This is due, in part, to the difference in surface area per unit of volume at the nanoscale.

For a given material, increasing the number of nanoscale particles increases the proportion of atoms on the surface compared with the number of internal atoms. Atoms at the surface often behave differently from those located in the interior since they have a higher energy state. The result is that more chemical reactions can take place between atoms and molecules at the surface. Essentially, nano particles act as miniature chemical reactors.

In addition, other properties such as magnetism, hardness and electrical and heat conductivity can be changed substantially by modifying materials at the nanoscale. These changes arise from surprising collective and quantum sized effects that arise from confining electrons in nanometer-sized structures. These types of coating structures allow for the addition of silver additives for the purpose of protecting surfaces from bacteriological damage including MRSA, E.coli, etc. The silver additive in BioLOC has an effective lifespan of 22 years by itself and when we integrate it into our coating structure it will continue to be effective as long as the coating is present on the surface.

## Product List

BioLOC Antimicrobial Additive mixed into our coatings protects most all substrates, inhibiting the reproductive abilities of bacteria and bacterial pathogens:

- Sentry Circuit Shield
- Sentry Concrete Shield
- Sentry Metal Shield
- Sentry Stone Shield
- Sentry Wood Shield

## Impact

- Increased morbidity (serious consequences and permanent disability )
- The length of hospital stay is prolonged, on average by 5–10 days.
- The risk of death approximately doubles in patients who acquire hospital infection.
- Hospital-acquired infections are very expensive and contribute significantly to the escalating costs of health care. It has been argued that, even if moderately effective, a hospital infection control program is one of the most cost-effective and cost-beneficial preventative medical interventions currently available.

## Direct Costs

**Overall annual direct costs of HAI to U.S. hospitals range from \$28.4B to \$33.8B/year**

- Nosocomial infections are estimated to occur in 5% of all acute-care hospitalizations
- The incidence rate is 5 infections per 1,000 patient-days. Based on the 35 million patients admitted to 7,000 acute-care institutions in the United States, the incidence of HAIs is more than 2 million cases per year.<sup>1</sup>

## Applications in Industry

- Healthcare
  - Hospitals, Urgent Care Facilities, Nursing Homes, Laboratory Supply, EMT
- Veterinary
  - Clinics, Kennels
- Education Facilities
  - Public, Private
- Retail Businesses
  - Shopping Centers, Grocery Stores, Pharmacies, Malls, Gyms
- Financial Institutions
  - Banks, Credit Unions, Kiosk Banking, ATM's
- Device Manufacturers
- Industrial Equipment
  - Air Handling Systems
- Transportation
  - Automobile, Airline, Bus, Light Rail
- Military
  - Barracks, Ships, Transport Vehicles ,Aircraft, Hospitals
- Travel
  - Hotels, Motels, Resorts, Cruise Ships

## Available Market

- Research
  - There is an overwhelming need to address the hospital-acquired infection rates in the United States, which is a serious cause of concern in the healthcare industry. The ability of **antimicrobial coatings** to address the above stated concern expects to offer good growth opportunities. There is an overwhelming need to address the hospital-acquired infection rates in the United States, which is a serious cause of concern in the healthcare industry. The ability of **antimicrobial coatings** to address the above stated concern expects to offer good growth opportunities.

## Market Research Resources

- Frost & Sullivan's Chemicals and Materials Research & Consulting
  - Frost & Sullivan (<http://www.chemicals.frost.com/>) finds that the U.S. **Antimicrobial Coatings** Markets earned revenues of \$175.4 million in 2005 and estimates this to reach \$558.7 million in 2012. The market expects to grow with the increasing need to address microbial growth in end application markets like healthcare facility, HVAC equipment markets.

### References

1. The Direct Medical Costs of Healthcare-Associated Infections in U.S. Hospitals and the Benefits of Prevention. [http://www.cdc.gov/HAI/pdfs/hai/Scott\\_CostPaper.pdf](http://www.cdc.gov/HAI/pdfs/hai/Scott_CostPaper.pdf)  
The Impact of Hospital-Acquired Bloodstream Infections.  
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2631709/pdf/11294700.pdf>