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# **MADISON CHEMICAL INDUSTRIES INC.**

## **InfoTech Bulletin #8**

### **“MicroSpear” Anti-Microbial Technology General Introduction**

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**Madison Chemical Industries Inc.**

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## The “Sanitary Surfaces “and Public Health Challenge

There is growing awareness in many workplaces that cleanliness of the surfaces around us has a significant impact on human and animal health. Micro-organisms cause spoilage in the food industry, contamination in food and pharmaceutical production areas, illness to anyone in places where people congregate.

With that growing awareness comes a daunting question: how are we to achieve the elusive goal of keeping our surroundings safe? While the marketplace abounds with disinfectants and sanitizers, these products are temporary in nature. Typically, they work “sacrificially”, by leaching out of the product to which they have been added. The challenge has been to find a more permanent solution.

## The Madison Solution

In 1999, Madison Chemical Industries Inc. launched the first of many anti-microbial coatings, unique in that their ability to remain bacteria-free for the life of the coating itself. The key was an additive which, at the time, we simply called our “AM” technology. Today we call it MicroSpear<sup>1</sup>. Initially the focus was on the internal lining of tanks and pipelines carrying and storing both potable and waste water.<sup>2</sup>

In 2005, several Madison products containing MicroSpear were approved by NSF (National Sanitation Foundation) for direct contact with drinking water. This provided third party proof of the purity of MicroSpear and paved the way for its use in other Madison products. Today, for example, MicroSpear is a standard component in several of our GemThane maintenance coatings. It is optional in most other GemThane products and in most of our “Infrastructural” line of industrial polymer protective coatings.

## How Does The AM Technology Work?

By combining an inherently superior coating with our Anti-Microbial system, we can create coatings that not only last at least twice as long as standard paints and coatings but can provide a bacteria-free surface for the entire service life of that coating. Here’s how and why the system works.

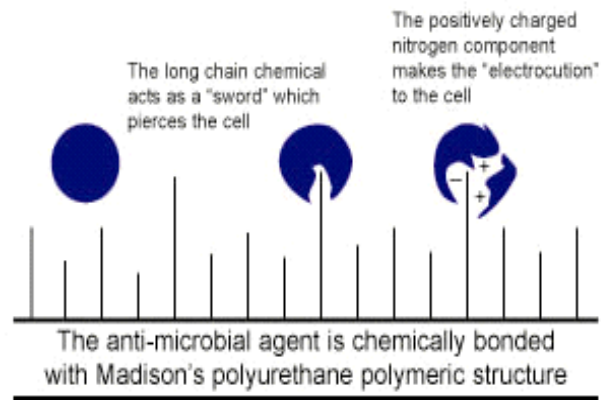
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<sup>1</sup> Madison, MicroSpear and GemThane are trade marks of Madison Chemical Industries Inc. All rights reserved.

<sup>2</sup> This application is further discussed in InfoTech Bulletin No. 23, which is available on request.

## 1. It Spears The Microbe

To you and me, MicroSpear looks like baby powder and is just as harmless. In fact, it is so safe that it is E.P.A.<sup>3</sup> approved. However, viewed microscopically, the individual particles are bristling with barbs or “spears”; hence, the name MicroSpear. To a single-celled organism, each particle of MicroSpear looks like an 800-pound porcupine. On contact with a protective coating containing MicroSpear, the cell wall is either pierced, causing it to perish immediately, or is damaged so that the microbe perishes when it tries to divide and reproduce. Because this is a physical phenomenon rather than a chemical one, the efficacy of MicroSpear is not depleted in any way over time, nor is the microbe able to mutate or adapt (as they can with chemically-based anti-microbials such as the widely-used triclosan -- see Reuters News Agency bulletin Thursday, Oct 20, 2005).



## 2. MicroSpear “Additive” The Microbe

Madison’s MicroSpear contains positively charged nitrogen ions. This constitutes an electrical charge that is infinitesimal to you and me, but to a microbe, it’s deadly because the electrical charge disrupts the microbe’s electrochemistry. The result of the porcupine effect and the “electrocution” effect is like a “one-two punch”.

## 3. MicroSpear is Integral To The Coating

Part of the elegance of Madison’s AM (anti-microbial) technology is that MicroSpear is more than just an additive. Our research team found a way of polymerizing it right into the chemical backbone of the polyurethane resin. MicroSpear is an integral part of the coating itself, non-leaching and non-diminishing. It isn’t just trapped in the coating film; it’s part of it, throughout the entire coating thickness.

## 4. MicroSpear is Completely Permanent

It follows from the above that Madison’s AM technology is totally permanent. It simply cannot be extracted from the coating because it is part of the polymer. The microscopic barbs continue to work year after year, just like an ancient warrior would use his spear again and again. The electrical charge is also permanent, just like the Van der Waals effect well known to electrical engineers. MicroSpear cannot be flushed out, abraded out or worn out. It cannot evaporate, migrate or dissolve. It is not ingested or consumed by the microbes. It remains present for the life of the coating.

<sup>3</sup> United States Environmental Protection Agency  
Anti-Microbial Technology

## **5. MicroSpear Keeps On Working, Even If The Coating Is Damaged**

Even if the coating is gouged or chipped, MicroSpear continues to protect the substrate. Small damaged areas actually form a protective scab of corrosion by-product that continues to shield the surface below. In any event, corrosion is minimal because the pH is relatively neutral.

## **6. The Microbes Can't Adapt**

Unlike the phenomenon of bacteria becoming resistant to antibiotics, we have a strictly physical process occurring here. Because of the "one-two" mechanism, we are not creating the conditions that allow micro-organisms to adapt or develop resistance.

## **7. It Is Proven And Approved**

Third party lab tests are available proving the effectiveness and the permanence of MicroSpear. It is also approved by the E.P.A.

## **Disclaimer**

The E.P.A. prohibits claims as to the efficacy of anti-microbial coatings on the purity of water and other potables coming into contact with said coatings. Madison makes no such claims, express or implied.

## **Commonly Asked Questions**

Q. How much does it cost?

A. A growing number of Madison coatings contain MicroSpear as a standard ingredient; in such cases, the Technical Data Sheet will say so. On most other products, it can be manufactured into the coating on a special order basis; this adds about 10% to the cost of the coating into which it is being incorporated.

Q. To which products can it be added?

A. Just about any Madison Chemical coating.

Q. What literature is available?

A. A technical paper and a detailed PowerPoint presentation. To qualified parties, a copy of our third party test results can be made available.

Q. How can I find out more?

A. Contact your local Madison dealer or staff representative. If you don't know who they are, call head office at (905) 878-8863 and ask for our Sales Support Group.