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Bio-Gel® Bacilli Can Take The Heat!

By Dr. Stuart Mitchell

Successfully used for many years in a wide range of industrial and consumer applications are specialty-cleaning products comprised of microorganisms. Via respective enzymes and metabolic pathways, microorganisms break down, degrade, and consume organic loads.

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Microorganisms are low risk because those commonly used in cleaning products are well-known, nonpathogenic, and non-toxigenic; meeting the criteria for classification as Class 1 organisms or safe for people and the environment (according to U.S. NIH (National Institutes of Health) guidelines).

Selected strains of microorganisms in cleaning products offer beneficial characteristics.

- Nonpathogenic to humans and animals.
- Rapid degradation, consumption, and digestion of organic wastes.
- Generation of safe, innocuous digestive by-products that do not produce malodors.
- Grow and reproduce quickly and readily within the environments of product use.

The incorporation of bacteria into cleaning products is commonly done with bacteria in spore form. Spores are a metabolically inactive state in the life of the bacterial cell. Spores are highly resilient due to their resistance to unfavorable environmental conditions (high heat, low water content, little or no nutrients, acidic/alkaline pH, harsh antimicrobial chemicals, toxic chemical agents, radiation, and desiccation).

Bacteria degrade and break down complex organics, including proteins, refined and resistant carbohydrates, starches, greases, fats, oils, urine, and others via the cell's enzymatic activity. Enzymatic degradation of these complex organic substrates results in simpler compounds and molecules that are used by bacteria as a food source.

Bacterial endospore ("spores") are tough, dormant structures that form within the cell wall of certain types of bacteria (such as Bacillus bacteria). Spores form in response to hostile environmental conditions. Spores that form in Bacillus bacteria provide dormancy at high temperature since enzyme proteins change shape as the spore dehydrates.

Study of enzyme structures within endospores indicates that reversible relaxation of their three-dimensional structure is the strategy Bacillus bacteria use to survive at temperatures deadly to non-spore forming cells.

Internal bonds of the bacteria's folded enzymes relax to form long chains of protein molecules when exposed to high temperatures (such as boiling water at 212°F or 100°C). Long chains move freely within the low water content of an endospore's core. The cell machinery stops and the dormant state associated with the endospore is the result since the functional enzyme shape has relaxed. The protein chains refold back into the normal enzyme structure when cell temperature becomes more hospitable. At this point, the cell returns to normal functioning.

Bio-Gel® is a range of scientifically advanced bacterial cleaning products that are biodegradable, nonpathogenic, non-toxic, non-caustic, and non-corrosive. Bio-Gel® brand resource cleaning products focus on proteins, refined and resistant carbohydrates, starches, greases, fats, oils, urine, and others; leaving behind a fresh, clean scent. An optimum resource cleaning, recurring revenue, professional service system for drains, mops, dumpsters, and many more. As an essential part of any sustainable resource-cleaning program, Bio-Gel® Bacilli can take the heat!

- Bacilli double in number approximately every 20 minutes.
- Ready-to-use with extra-long shelf life.
- Synergized bacterial blend to effectively remove organic build-ups.
- Thickened product specifically designed with excellent clinging properties.
- Reduces foul odors, improves drain flow, and is safe for all drain lines.
- Fresh citrus scent.
- If needed, can be diluted with water, and foamed.

For more information, please contact your favorite pest management distributor or PestWest at 866.476.7378.

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