



BIOSAFE® SILANE-BASED ANTIMICROBIAL PRODUCTS

Protective Solutions from RTP Company

Quick Information

- ▶ Controls damage to plastic articles caused by microbic growth
- ▶ Active ingredient used in FDA 510(k) medical devices
- ▶ Non-migratory and non-depleting solution
- ▶ Improved colorability

Imagine a thermoplastic masterbatch or compound that provides antimicrobial protection against bacteria, fungi (mold and mildew), and algae to plastics. At RTP Company, we not only imagined it, we've made it a reality.

Concerns over exposure to microbes and bacteria on article surfaces has generated increased interest in antimicrobial additives. Unprotected plastics can be attacked by microbes, leading to unsightly discoloration unpleasant odors, and polymer degradation issues.

Antimicrobial additives improve a wide range of plastic products by providing inherent microbe-fighting properties that control the spread of bacteria, fungi, and algae on the surface of treated products. This results in longer product life-cycles and improved aesthetics.

Biosafe's silane-based solution provides plastics with antimicrobial protection that is non-migratory and non-depleting—maintaining its effectiveness for the useful life of treated articles. Additionally, the additive does not discolor the host resin, allowing for improved colorability and make it a preferable antimicrobial solution.

Biosafe's active ingredient has been used in reviewed FDA medical devices under

510(k) procedures and has passed ISO 10993-5 testing.

Lower active ingredient loading requirements can make it a more cost effective solution. Antimicrobial properties can be achieved with 0.5-1.0% Biosafe concentrations in finished goods. It is free of VOCs, arsenic, heavy metals, or polychlorinated phenols and provides low toxicity and ease of handling.

Biosafe masterbatches and compounds from RTP Company are fully processable at the melt temperature of compatible thermoplastic polyurethane (TPU) and Pebax (PEBA) resins.

Biosafe is suitable for items manufactured via injection, fiber, film, sheet, or profile extrusion. It is ideal for use in household and consumer goods, medical devices, business machines, sports and leisure equipment, appliances, transportation interiors, construction materials, and most outdoor applications

Biosafe antimicrobial masterbatches and compounds from RTP Company... another innovation from the leader in specialty compounding.

BIOSAFE® Silane-Based ANTIMICROBIAL

BIOSAFE® is a registered trademark of BIOSAFE, Inc.

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ANTIMICROBIAL PRODUCTS

Protective Solutions from RTP Company

Performance Comparisons of Leading Antimicrobials for Plastics

	BIOSAFE® Silane-based	Silver-based	Triclosan
Mode of Action	Physically ruptures cell membrane	Releases ionic species that react with cell DNA and disrupt critical life process in the cell	Releases bischlorinated phenol (PCB) for consumption or cellular absorption, causing lethal mutation in the cells
Colorability/Aging	Excellent	Poor to Good	Good
Matrix/Durability	Physical blend/Extended	Physical blend/Extended	Physical blend/Limited
Migration	Very Limited	Limited	Complete
Cost	Moderate	Expensive	Moderate
Application active ingredient %*	0.25% - 0.5%	1-3%	0.3%
Adaptive Organisms	Does not promote	Does not promote	Documented adaptation
Food Contact	No	Yes	No
Processing and handling safety**	Mild eye irritation	Harmful if inhaled; moderate eye irritation, abrasive and reactive	Harmful if absorbed through skin; moderate eye irritation; avoid contact with skin, eyes, or clothing; do not breathe dust
Polymers compatibility	Limited	Most	Limited
Typical Application	<ul style="list-style-type: none"> • Medical devices • Appliances • Sports & leisure • Outdoor applications 	<ul style="list-style-type: none"> • Dark colored parts • Durable goods • FDA compliance 	<ul style="list-style-type: none"> • Disposable • Low cost items



* Varies with polymer selection and part geometry ** Based on current EPA labels

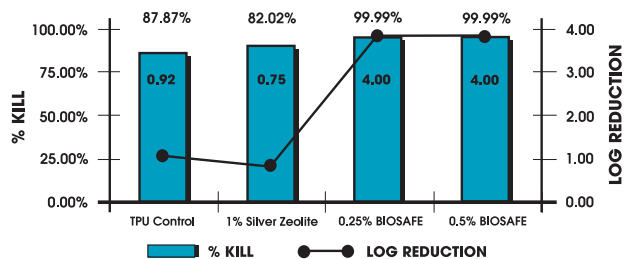
Additive Masterbatch formulations:

PEBA MCX 117693
 TPU MCX 117672

- Recommended masterbatch let down ratio (LDR) is 5-10% (20:1-10:1). LDR is dependent upon application environment, part thickness, and part geometry.
- RTP Company provides no warranty regarding antimicrobial additive performance. Testing of finished goods by the manufacturer is required to ensure proper performance for individual products and end-use environments.
- RTP Company can coordinate microbiological testing necessary for antimicrobial applications.

4 Hour Coverslip Test:

Thermoplastic Polyurethane (TPU)



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