GREAT AMERICAN PACKAGING

Custom manufacturer of poly bags & film

Micro DefenS

Antimicrobial Film

Micro DefenS

Introducing a cutting edge new alternative to flexible packaging.

Micro DefenS is a flexible polyethylene film with antimicrobial properties. The film is designed to inhibit the growth of bacterial AND fungal microbes like e. Coli, s. aureus, MRSA & more.

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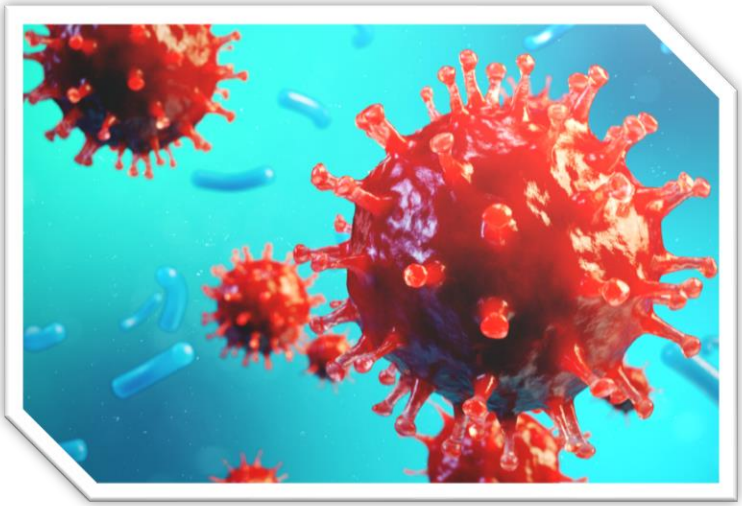
Microbials defined*

Adjective

1. Relating to or characteristic of a microorganism, especially a bacterium causing disease or fermentation.

2. “Skin is a major source of microbial contamination during a surgical procedure."

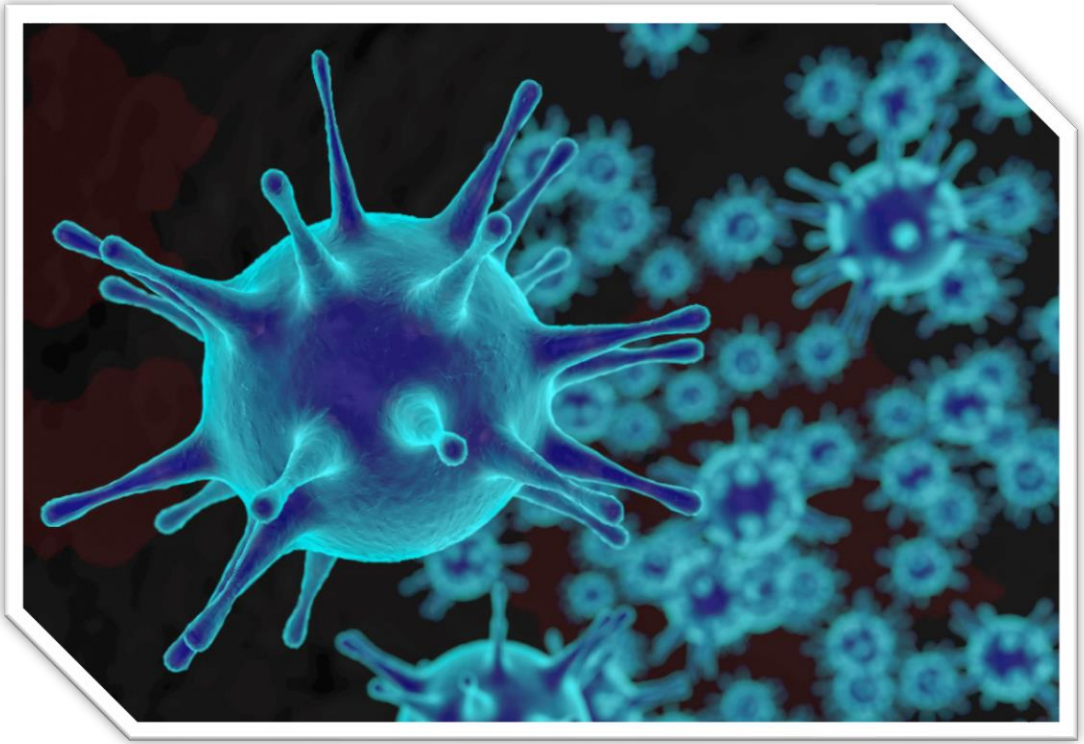


**https://en.oxforddictionaries.com/definition/microbial*

About Antimicrobial

Antimicrobial properties inhibit the growth, on the treated area, of disease, odor and stain-causing:

- Bacteria
- Molds
- Mildews
- Fungi



Why Use Antimicrobials?

- Improve safety from pathogenic micro organisms
- Reduces the risk of food contamination from surface contact
- Address consumer concerns
- Enhance product freshness
- Eliminate undesired odors
- Control unsightly stains

Previously Existing Antimicrobial Technology

Quantitative Antimicrobial Assessment: ISO 22196:2011

Amount of growth after 24 hours

Sample Description	Initial Microorganism Count	Microorganisms Recovered
Untreated ABS	225,000	310,000
MicroBlok Treated ABS	225,000	< 50
Untreated Polystyrene	1,650,000	3,950,000
MicroBlok Treated Polystyrene	1,650,000	< 50
Untreated TPU	225,000	2,900,000
MicroBlok Treated TPU	225,000	< 50

Testing Protocol ISO 22196:2007. *A bacterial inoculum is placed in microdroplet form on the surface of polymer chip samples. Each sample is placed in its own container with a lid. A sterile film is placed on top over the inoculum to encourage good contact. After 24 hours of incubation at 37°C, 50 mL of Letheen broth was added to the container and shook. Sample test data based on custom-formulated materials for specific resins listed.*

Now Introducing:

Polyethylene Films with Antimicrobial technology!

Introducing:

Polyethylene Flexible Films with Antimicrobial technology!

PE Films - Efficacy Analysis/Bacteria

Quantititive Assessment of Activity – ISO 22196:2011 E.coli		
For Great American Packaging Specific Bags		
Concentration of starting inoculum		$1.92x10^5$
Polyethylene Bag		
Sample Description	**# of Bacteria Recovered**	**% Reduction**
Inside	$<2.00 X 10^1$	>99.9%
Outside	$<2.00 X 10^1$	>99.9%
Inoculum Control	$9.16 X 10^6$	

Quantititive Assessment of Activity – ISO 22196:2011 S. aureus		
For Great American Packaging Specific Bags		
Concentration of starting inoculum		$2.64x10^5$
Polyethylene Bag		
Sample Description	**# of Bacteria Recovered**	**% Reduction**
Inside	$<2.00 X 10^1$	>99.9%
Outside	$<2.00 X 10^1$	>99.9%
Inoculum Control	7.32 X 105	

PE Films - MRSA

Quantititive Assessment of Activity - ISO 22196:2011 *MRSA*					
Concentration of starting inoculum		1.63x10^5			
	Sample Description	**# of Bacteria recovered**	**Log Value**	**R = [log(B/C)]**	**% Reduction**
1	PE control no antimicrobial	1.17 x 106	6.1	---	---
2	Sample 1 PE bag with MicroBlok Z	<2.00 x 10^1	<1.3	>4.8	>99.9%
3	Sample 2 PE bag with MicroBlok Z	<2.00 x 10^1	<1.3	>4.8	>99.9%
Inoculum control		3.40 x 10^6	6.5	---	---

PE Films - Antifungal Assessment

AATCC Test Method 30-2013	Asperigillus niger (ATCC #6275)

**The width of the growth-free zone surrounding the test specimen

*Percentage of specimen free of growth

Sample Description	Growth Free Zone (MM)*	Surface Inhibition (%) **
Inside	0	100
Outside	0	100

Comments: *In the AATCC test method 39, both sides of the same remained free of growth from the A.niger test organism*

Antimicrobial

Antimicrobials regulated by the EPA under FIFRA

- Federal Insecticide, Fungicide, and Rodenticide Act

All antimicrobial technology used in MicroBlok is registered with the EPA

- RoHs and REACH-complaint solutions

Antibacterial Resistance

The increased risk of antibiotic resistance in hospital and medical facilities is expected to continue.

- **Antimicrobial films provide a stop-gap to help reduce the spread of many antibiotic-resistant bacteria like S. aureus and MRSA.**

Table 1: Mechanisms of antibiotic resistance and examples of bacteria that have developed antibiotic resistance.

Mechanism	Resistant organism	Antibiotic affected by bacterial resistance
Antimicrobial inactivation		
β-lactamase	• *Staphylococcus aureus* • *Haemophilus influenzae* • Enterobacteriaceae*	• Penicillins • Cephalosporins
Aminoglycoside-inactivating enzymes	• Enterobacteriaceae	• Gentamicin • Tobramycin
Altered target site		
Altered penicillin-binding proteins	• *Streptococcus pneumoniae* • Methicillin-resistant *S. aureus*	• Penicillin • Methicillin • Cloxacillin
Altered DNA gyrase or topoisomerase	• *S. pneumoniae* • Enterobacteriaceae • *Pseudomonas aeruginosa*	• Ciprofloxacin • Levofloxacin • Moxifloxacin

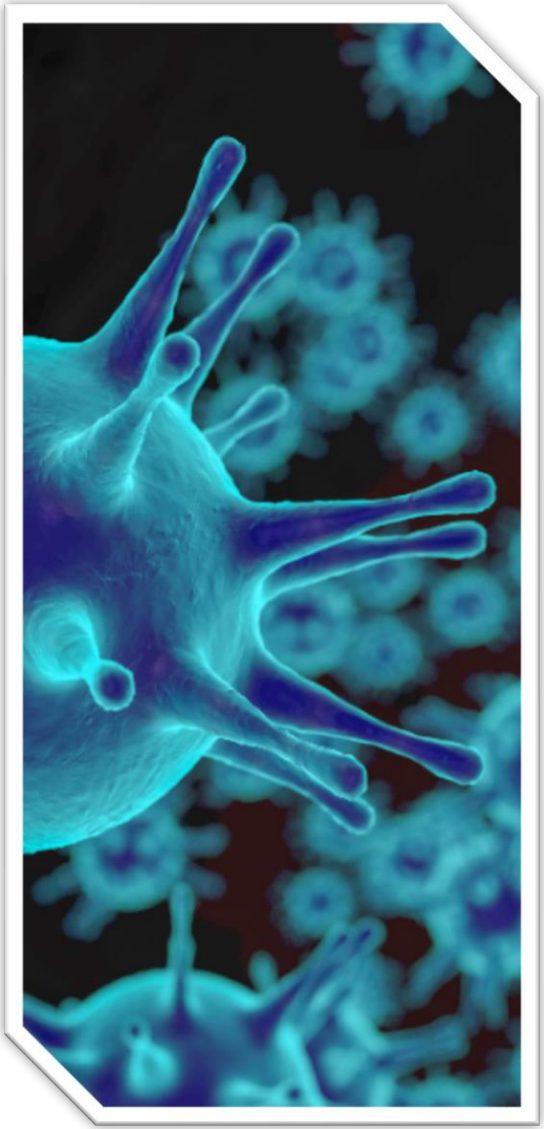


*Table 1: NCBI National Library of Medicine, National Institute of Health Journal List CMAJ v.180(4); 2009 Feb 17 PMC2638041

Unique Properties

A Competitive Edge for you

- Cutting Edge technology unique to flexible films blends (*vs coatings*).
- Opportunity to enter into new or less penetrated markets
- Limitless styles and sizes in PE bags and film
- Plain and printed PE bags and film

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For more information, contact one of our Packaging Consultants:

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Ph. 323.582.2247 | Email: orders@greatampack.com | www.GreatAmPack.com

USDA

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FDA Approved

100% RECYCLABLE

COMPLETED! NSF