

# Using Antimicrobials to Inhibit Surface Growth on Durable Coated Fabrics



# Who is CFFA?

- THE CHEMICAL FABRICS AND FILM ASSOCIATION is an international trade association representing manufacturers of polymer-based fabric and film products, used in the building and construction, automotive, fashion and many other industries.
- The members of the Performance Products Division manufacture chemical fabrics and film used in numerous applications such as contract upholstery, marine upholstery, pool liners, and transportation interiors.



# Who is CFFA?

PERFORMANCE PRODUCTS

- **ERIC PETERSEN**
  - Director of Sales & Marketing, CGPC America/Enduratex™
  - Chair Performance Products Division, Chemical Fabrics and Film Association



# What are Antimicrobials?

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- Registered with EPA, agents added to products that inhibit
  - the growth of fungi, such as mold and mildew that can stain surfaces, lead to their deterioration, and cause odors.
  - the growth of harmful bacteria, such as e. coli and salmonella, and viruses, such as Sars-coV-2, that cause disease.
  - Antimicrobials are also known as Biocides.



# Why are they used in coated fabrics?

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- In addition to inhibiting mold and bacteria from growing on coated fabrics surface or backing, they increase sustainability of products by preventing product deterioration, extending their useful life.



# Antimicrobials for Plastics – Requirements

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- Broad spectrum antimicrobial
- Compatible with polymer system
- Heat stable
- Regulatory acceptance
- Cost-effective
- Migrate to surface
- Low leach rate



# Vinyl Producer and Antimicrobial Supplier Partnership

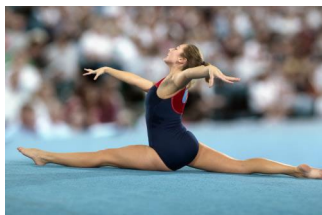
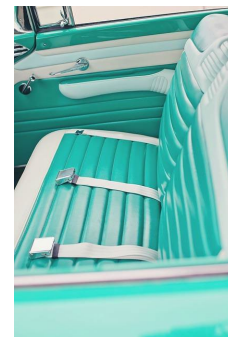
PERFORMANCE PRODUCTS

Vinyl, as a plastic, is unique in that it can be modified by a wide variety of additives to give it properties that are required by the specific end use. A vinyl film used as part of a marine upholstery could contain a half dozen additives to give the film the desired flexibility, color and processing stability. Suppliers of antimicrobials not only bring their product to the vinyl film producer, but they also bring their expertise in biochemistry and microbiology testing.



# Treated Articles

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Images provided by Valtris



# Marine Seating Challenge

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- Unsightly stains, dirt, or mildew growth may be found on the surface of a marine seat.
- While seats can be cleaned, what happens to the dirt or debris that gets into the stitching of the fabric?
- The vinyl that you look at or sit on is a small but most visible part of the total seat construction.

# Marine Seating Challenge (cont.)

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## Pink Staining

- Vinyl is usually attached to a fabric to give it dimensional stability and physical strength.
- Urethane foam of various thicknesses provides the cushion, and the whole seat is usually built on a piece of plywood.
- If contaminated dirt gets inside the cushion, staining organisms can grow in the foam cushion, the most notable of which is a family of bacteria (streptomyces species), such as *Streptoverticilium Reticulum*, that excrete a red dye.
- This dye is soluble in plasticizer (an ingredient in flexible PVC) and will diffuse and migrate to the vinyl surface causing a pink stain.
- Even though the vinyl compound is adequately protected against mildew growth, pink staining can occur if contact is made with components of a seat that support bacterial growth, and this stain cannot be removed.

# Durable Coated Fabric Solution

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- The solution consists of four components:
  - Keep seats and adjacent surfaces clean.
  - Remove or kill any surface growth with a topical biocide but be sure to rinse after application.
  - Use materials that are **treated** to inhibit fungal growth.
  - Keep covered, if possible, when not in use.
  
- New materials that have been treated with an effective antimicrobial to inhibit new growth should be specified along with other performance requirements.
  - Assures long-term protection components such as vinyl, urethane foam, and wood.

# Marine Seat Construction

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- Reticulated foam
  - Known for greater airflow due to its extremely open-cell structure.
  - Outdoor furniture & boat manufacturers use because of its ability to pass water directly through the foam, which creates higher levels of airflow, allowing for faster drying of furniture cushioning.



# Marine Seat Construction (cont.)

## PERFORMANCE PRODUCTS

- Reticulated foam is flexible polyurethane foam that provides both ultimate drainability as well as durability.
- Significantly higher quality cushioning material available in a wide variety of density and firmness qualities.
- Reticulated foam is:
  - technologically advanced;
  - very porous, low density solid foam,
  - highly durable,
  - mildew resistant,
  - amine free.
- Always use Reticulated foam products that are infused with a safe antimicrobial additive that inhibits the growth of mold, mildew, and odors.



# Care of Durable Coated Fabrics

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## Can disinfectants be used, or will they damage antimicrobials?

- Yes, antimicrobial disinfectants can be used.
  - Most common are quaternary ammonium chemicals, or quats; chlorine bleach; and hydrogen peroxide.
- Care must be taken to extend use and recommend rinsing after each use or weekly.



# Why have there been efforts to remove antimicrobials from coated fabrics?

- Some oppose the use of chemicals in consumer products and may not understand the benefits.
- Antimicrobials used in coated fabrics are not topical treatments.
  - They are tightly embedded in the polymer compounds.
  - Have been used safely for decades.



# Test Methods and Standards



# Test Methods and Monitoring

**Are there test methods to determine if coated fabrics are resistant to microorganisms?**

- Mold & Mildew - STM 120 (based on ASTM G-21)
- Bacteria – STM 300 (based on AAATC TM 147)
- Pink Stain – STM 141 (based on ASTM E-1428)

**Are they monitored/regulated?**

- Yes, by EPA

# Biocide Laboratory Tests

- ASTM G21 (Fungi)
- ASTM E-1428 (Pink Stain)
- Bacterial Resistance
- Algal Resistance and Soil Burial

# Are there industry standards that establish how properties are measured to the test methods ?

- CFFA U201F – Indoor Contract Upholstery
- CFFA-Marine/Vinyl-201D
  - This standard provides a list of properties, including abrasion, mildew resistance, and seam strength and the applicable test methods to ensure performance standards are met.

# QUESTIONS?

# Thank you!

