

KYDEX® Sheet with Microban® Antimicrobial Protection

TB - 159

Introduction

KYDEX® sheet is available with the option of Microban® protection — an additive that continuously fights the growth and spread of microbes such as odor and stain causing bacteria, mold and mildew. KYDEX, LLC is the only thermoplastic sheet manufacturer licensed to offer Microban® protection for use in:

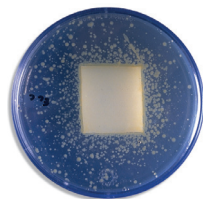
- Airline interior components
- Protective wall coverings
- Healthcare furniture
- Medical device enclosures

General Information

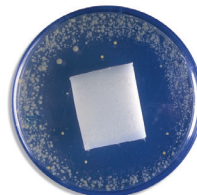
What is Microban Antimicrobial Product Protection?

Microban protection is an additive that contains active ingredients which are incorporated into the polymer structure when KYDEX® sheet is manufactured. There is no single, generic Microban additive. There are over twenty different additives to choose from depending on the material being treated. The Microban Company experts recommended the additive Triclosan to treat the KYDEX® sheet material. Triclosan is an organic antimicrobial with a broad efficacy spectrum. The Microban additive is homogeneously distributed throughout the matrix, enabling it to provide antimicrobial protection across the entire surface area and into the substrate. When microbes come in contact with a KYDEX® sheet that contains Microban, the ingredient penetrates the cell wall, affecting the cell's ability to function, grow and reproduce. The active ingredient is durable, lasting as long as the KYDEX® sheet.

The Microban anti-microbial product in KYDEX® sheet is not OBPA (arsenic) or TBT (Tributyl tin) based. It is an organic based Triclosan product that proves to be the most effective, and safe, product for KYDEX® sheet that will last for the life of the finished part. Triclosan has a 30 year safety record and is proven as one of the most effective and safe antimicrobials on the market. Triclosan is commonly found in toothpaste, hand soaps and many other household products.



Without Microban antimicrobial product protection



With Microban antimicrobial product protection

These samples were tested for efficacy against bacteria using the Kirby Bauer test method. Both samples were inoculated with bacteria and then photographed after 24 hours. The sample on the right was manufactured with Microban protection and the sample on the left was untreated. The sample with built-in Microban protection showed no growth. The untreated sample showed significant contamination.



How Does Antimicrobial Protection Work?

Microban Triclosan is a broad spectrum bacteriostatic and fungistatic additive. As a halogenated bisphenol it affects the metabolic and biochemical processes of bacteria, mold and yeast. The active ingredient has been clinically documented to be effective against a non-comprehensive list of organisms. A sample of the Minimum Inhibitory Concentration (MIC) against selected microorganisms is shown on page two. These values are typical MIC number and may vary in actual use applications.

KYDEX, LLC

ISO 9001 and 14001 Certified

Customer Service

6685 Low St, Bloomsburg, PA 17815 USA
 Phone: 800.325.3133, +1.570.389.5810
 Outside the US: +1.570.389.5814
 Fax: 800.452.0155, +1.570.387.7786
 Email: info@kydex.com

Technical Service

Phone: 800.682.8758 ext. 581
 Fax: +1.570.387.8722
 Outside the US: +1.570.387.6997 ext. 581

www.kydex.com

KYDEX® Sheet with Microban® Antimicrobial Protection

TB - 159

**Minimum
Inhibitory
Concentration
(MIC)**

Gram Negative

Achromobacter sp.	3.0 mg/ml
Brucella suis	0.03 mg/ml
Escherichia coli	0.3 mg/ml
Escherichia freundii	<100 mg/ml
Haemophilus influenzae	33.0 mg/ml
Klebsiella aerogenes	0.3 mg/ml
Klebsiella edwardsii	0.3 mg/ml
Klebsiella pneumoniae	0.3 mg/ml
Moraxella duplex	0.01 mg/ml
Moraxella glucidolytica	0.3 mg/ml
Moraxella lwoffii	0.1 mg/ml
Neisseria catarrhalis	330. mg/ml
Pasteurella pseudotuberculosis	10.0 mg/ml
Pasteurella septica	0.1 mg/ml
Proteus mirabilis	0.3 mg/ml
Proteus morgani	10.0 mg/ml
Proteus rettgeri	33 mg/ml
Proteus vulgaris	0.1 mg/ml
Pseudomona aeruginosa	>1000 mg/ml
Pseudomonas fluorescens	>100 mg/ml
Salmonella paratyphi	0.3 mg/ml
Salmonella pullorum	0.3 mg/ml
Salmonella typhi	0.3 mg/ml
Salmonella typhimurium	0.3 mg/ml
Serratia marcescens	>100 mg/ml
Shigella dysenteriae	0.1 mg/ml
Shigella flexneri	0.3 mg/ml
Vibrio cholerae	10 mg/ml
Vibrio eltor	10 mg/ml

Gram Positive

Actinomyces naeslundii	1.0 mg/ml
Bacillus subtilis	0.1 mg/ml
Clostridium difficile	5.0 mg/ml
Corynebacterium acnes	3.0 mg/ml
Corynebacterium diphtheriae	3.0 mg/ml
Dermatophilus congolensis	1.0 mg/ml
Enterococcus faecalis (vancomycin resistant)	10 mg/ml
Ersipelothrix rhusiopathiae	3.0 mg/ml
Lactobacillus sp.	33.0 mg/ml
Listeria monocytogenes	3.0 mg/ml
Micrococcus lysodeikticus	3.0 mg/ml
Micromonospora chacea	0.1 mg/ml

Mycobacterium smegmatis	1.0 mg/ml
Mycobacterium tuberculosis	100 mg/ml
Mycoplasma hominis	1000 mg/ml
Mycoplasma orale	1000 mg/ml
Nocardia asteroides	1.0 mg/ml
Sarcina lutea	3.0 mg/ml
Staphylococcus aureus	0.01 mg/ml
Staphylococcus aureus (methicillin resistant)	0.6 mg/ml
Staphylococcus epidermidis	0.05 mg/ml
Streptococcus faecalis	3.0 mg/ml
Streptococcus pyogenes	3.0 mg/ml
Streptomyces coelicolor	3.0 mg/ml

Fungus & Yeast

Aspergillus fumigatus	10 mg/ml
Aspergillus niger	30 mg/ml
Blastomyces dermatitidis	3 mg/ml
Candida albicans	3-33 mg/ml
Candida brumptii	10 mg/ml
Candida dattila	10 mg/ml
Candida famata	10 mg/ml
Candida guilliermondii	33 mg/ml
Candida parakrusei	3 mg/ml
Candida parapsilosis	33 mg/ml
Candida pulcherrima	33 mg/ml
Candida stellatoidea	10 mg/ml
Candida tropicalis	10 mg/ml
Candida utilis	33 mg/ml
Cryptococcus neoformans	10 mg/ml
Epidermophyton floccosum	10 mg/ml
Hansenula anomala	10 mg/ml
Keratinomyces ajelloi	10 mg/ml
Microsporium canis	1-1 mg/ml
Microsporium cookei	33 mg/ml
Microsporium gypseum	10 mg/ml
Microsporium nanum	10 mg/ml
Neurospora sitophyllia	0.1 mg/ml
Penicillium egyptiacum	33 mg/ml
Pichia Farinosa	33 mg/ml
Shigella sonnei	0.1 mg/ml
Schizosaccharomyces pombe	3 mg/ml
Sporotrichum schencki	3-10 mg/ml
Trichophyton concentricum	10 mg/ml



KYDEX, LLC
ISO 9001 and 14001 Certified

Customer Service
6685 Low St, Bloomsburg, PA 17815 USA
Phone: 800.325.3133, +1.570.389.5810
Outside the US: +1.570.389.5814
Fax: 800.452.0155, +1.570.387.7786
Email: info@kydex.com

Technical Service
Phone: 800.682.8758 ext. 581
Fax: +1.570.387.8722
Outside the US: +1.570.387.6997 ext. 581

www.kydex.com

KYDEX® Sheet with Microban® Antimicrobial Protection

TB - 159

General Information (cont.)

Why is Antimicrobial Protection Important?

In the healthcare and airline industries, preventing the growth and spread of microbes—including odor and stain causing bacteria and fungi—is particularly important. Antimicrobial protection is a distinct benefit in areas where cleanliness matters.

What does this mean to you and your customers?

Increased awareness of the need to manage microbes has made the Microban name widely recognized and sought after. KYDEX® sheet with Microban slows the growth and spread of these microbes, making it easier for your customers to keep your products cleaner between cleanings for the useful life of the product. By using KYDEX® sheet products that contain Microban (designated by the letters MB), you provide a distinct advantage to your customers. No other thermoplastic sheet provider can offer you the Microban advantage in the airline interiors or healthcare industries.

Product Rights

KYDEX has exclusive global product rights to thermoplastic sheet that is *thermoformed, flat laminated and membrane pressed*.

KYDEX has the rights to pass on the Microban brand to your customers in *airlines, healthcare equipment enclosures and protective wall coverings*.



Microban International

Microban is the world's leading provider of safe, durable and effective built-in antimicrobial solutions with locations in:

N. AMERICA

Charlotte, NC USA
Montreal, ON Canada

S. AMERICA

Sao Paulo, Brazil

EUROPE

Milton Keynes, U.K.
Frankfurt, Germany

ASIA

Bangkok, Thailand

The Advantage

Get the KYDEX® MB advantage. Ask your KYDEX sales representative about the following KYDEX® sheet products that include Microban antimicrobial product protection:

- KYDEX® T MB for healthcare components and thermoformed parts
- KYDEX® XD MB for membrane-pressed components
- KYDEX® 150 MB for protective wall coverings, acoustical partitions and pre-laminated panels
- KYDEX® 5555 MB for airline interior components
- KYDEX® FST with Microban® protection for aircraft interior components - specifically formulated to meet all Boeing and Airbus toxicity requirements for aircraft interior components



KYDEX, LLC

ISO 9001 and 14001 Certified

Customer Service

6685 Low St, Bloomsburg, PA 17815 USA
Phone: 800.325.3133, +1.570.389.5810
Outside the US: +1.570.389.5814
Fax: 800.452.0155, +1.570.387.7786
Email: info@kydex.com

Technical Service

Phone: 800.682.8758 ext. 581
Fax: +1.570.387.8722
Outside the US: +1.570.387.6997 ext. 581

www.kydex.com

Because we cannot anticipate or control the many different conditions under which this information and our products may be used, we do not guarantee the applicability of the accuracy of this information or the suitability of our products in any given situation. Users should conduct their own tests to determine the suitability of each product for their particular purposes. Data in the physical property table represents typical values and are to serve only as a guide for engineering design. Results are obtained from specimens under ideal laboratory conditions. Right to change physical properties as a result of technical progress is reserved. THE PRODUCTS DISCUSSED ARE SOLD WITHOUT WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR USE, EITHER EXPRESSED OR IMPLIED, EXCEPT AS PROVIDED IN OUR STANDARD TERMS AND CONDITIONS OF SALE. Buyer assumes all responsibility for loss or damage arising from the handling and use of our products, whether done in accordance with directions or not. In no event shall the supplier or the manufacturer be liable for incidental or consequential damages. Also, statements concerning the possible use of our products are not intended as recommendations to use our products in the infringement of any patent. Consult local code and regulatory agencies for specific requirements regarding code compliance, transporting, processing, recycling and disposal of our product. Product not intended for use as a heat resistant surface. Texture, product grade and other conditions may cause variations in appearance.

This information supersedes all previously published data.