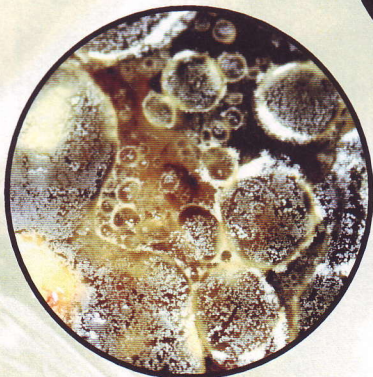


# GRIFFOLYN® ANTIMICROBIAL FILMS AND REINFORCED LAMINATES



**REEF INDUSTRIES, INC.**

The Manufacturing Leader of Specialized Industrial Plastic Films Since 1957.



## REEF INTRODUCES ANTIMICROBIAL ADDITIVES IN GRIFFOLYN® PLASTIC PRODUCTS

Reef Industries introduces the use of antimicrobial films and reinforced laminates that prevent the growth of harmful bacteria, fungi, mold and algae. The antimicrobial additive inhibits and/or kills bacteria, fungi, and mildew where the prevention of microbial growth is critical.

- Healthcare Facilities
- Hospitals
- Crawlspace
- Research Centers
- Homes and Building Structures
- Food Processing Plants



Griffolyn's® antimicrobial materials provide unique performance characteristics:

- Non-migratory.
- Wash resistant.
- Very stable in a wide range of environments across a broad temperature range.
- Non-toxic and environmentally safe.
- Durable and tear resistant.

Scientists have identified more than 100,000 species of mold. At least 1,000 species of mold are common in the United States. In the courtrooms, homeowners, renters and office workers are squaring off against builders, contractors, and insurance companies in an attempt to assign blame to a problem that can cost tens, if not hundreds of thousands of dollars per building to repair.

Different mold species can have varying health effects, but it is important to remember that any excessive mold growth needs to be taken care of, regardless of the species. Any excessive mold growth can lead to increased allergies, odors, toxicity, and structural problems. The top prevalent species of mold today are *Aspergillus*, *Stachybotrys*, *Cladosporium*, *Fusarium* and *Penicillium*. *Aspergillus* is the most common genus of fungi in our environment with more than 160 different species of mold. Sixteen of these species have been documented as causing human illness. *Aspergillosis* is now the 2nd most common fungal infection requiring hospitalization in the United States.

Reef Industries has put their antimicrobial plastic materials to the test against three fungi microorganisms in an effort to offer protection against common mildew, bacteria, fungi, algae and the resultant odor and discoloration caused by mold.

### THE TESTING METHOD

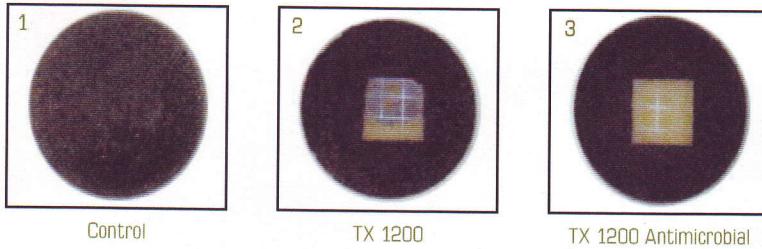
Reef Industries tested three fungi microorganisms (*A. Niger* ATCC No. 9642, *A. Pullulans* ATCC No. 15233 and *P. Pinophilum* ATCC No. 11797) against two Griffolyn® material samples (TX 1200 and TX 1200 Antimicrobial) using ASTM G 21-96 test method. 50mm x 50mm samples were inoculated with a microorganism culture and covered with glass slides. The samples were then incubated at 27 °C and greater than 85% RH (relative humidity) for 3 days using suspension of fungi equivalent to 10<sup>8</sup> cfu (colony forming unit). The zone of inhibition was taken after 5 days of exposure to fungi.

The results indicated that Reef's TX 1200 Antimicrobial product did not allow fungi to grow on, near or around it providing a range of performance.

## TEST RESULTS FOR FUNGI EXPOSURE

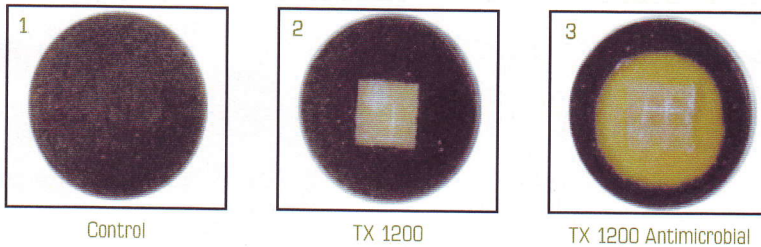
### Samples against *A. Niger* (Black Mold)

Sample 1 showed blackout growth of *A. Niger* over the entire surface area. Sample 2 showed signs of growth around and underneath an untreated sample of TX 1200. Sample 3 showed mold growth up to the edge of the sample, but no sign of growth on or beneath the sample itself.



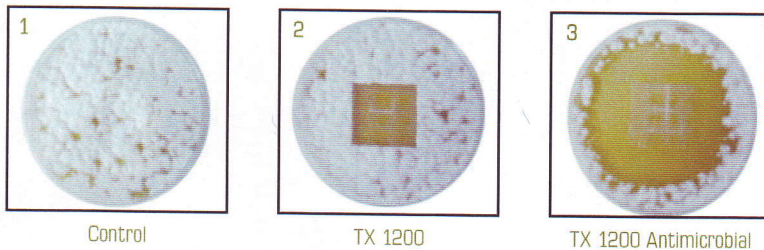
### Samples against *A. Pullulans* (Indoor Mold)

Sample 1 showed blackout growth of *A. Pullulans* over the entire surface area. Sample 2 showed signs of growth around and beneath an untreated sample of TX 1200. Sample 3 showed no sign of growth of *A. Pullulans* on the sample and in an area around the sample. It is evident that there was protection beyond the sample.



### Samples against *P. Pinophilum* (Indoor Fungi)

Sample 1 showed complete growth of *A. Pinophilum* over the entire surface area. Sample 2 showed no signs of growth on the untreated sample of TX 1200. Sample 3 showed no sign of growth of *A. Pinophilum* on the sample and in an area around the sample. It is evident that there was protection beyond the sample.



## EVALUATION OF ANTI-FUNGAL ACTIVITY

| MICROORGANISM        | CONTROL<br>(microorganism growth control) | TX 1200        |                          | TX 1200 ANTIMICROBIAL |                          |
|----------------------|---|----------------|--------------------------|-----------------------|--------------------------|
|                      | Condition                                 | Condition      | MM (halo in millimeters) | Condition             | MM (halo in millimeters) |
| <i>A. Niger</i>      | Positive for growth                       | Not Acceptable | 0                        | Acceptable            | 0                        |
| <i>A. Pullulans</i>  | Positive for growth                       | Acceptable     | 0                        | Highly Satisfactory   | 16                       |
| <i>P. Pinophilum</i> | Positive for growth                       | Acceptable     | 0                        | Highly Satisfactory   | 20                       |

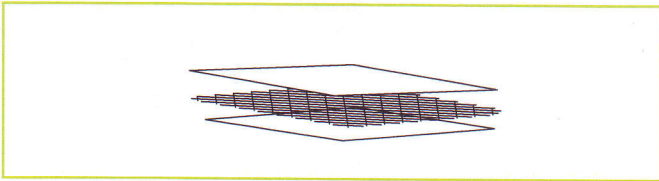
Highly satisfactory = inhibition of 6mm or greater

Satisfactory = inhibition of 2 to 5 mm

Acceptable = inhibition of 0 to 1 mm or absence of halo (absence of growth on the sample)

Not Acceptable = growth on the sample or under the sample

# GRIFFOLYN® TX 1200 ANTIMICROBIAL



Griffolyn® TX-1200 Antimicrobial is a 3-ply, nonmigratory, blended laminate combining two layers of linear low density polyethylene and a high-strength cord grid. It is specifically engineered to provide high strength and durability in a lightweight material.

| PHYSICAL PROPERTIES AND TYPICAL VALUES | PROPERTY              | ASTM TEST METHOD | U.S. VALUE                 | METRIC VALUE             |
|--|-----------------------|------------------|----------------------------|--------------------------|
|  | Weight                | D-751            | 33 LB/1000 FT <sup>2</sup> | 16 KG/100 M <sup>2</sup> |
|  | 3" Load @ Yield       | D-882            | 90 LBF                     | 400 N                    |
|  | 3" Load @ Break       | D-882            | 50 LBF                     | 222 N                    |
|  |                       |                  | 2350 PSI                   | 16 MPA                   |
|  | 3" Elongation @ Break | D-882            | 450 %                      | 450 %                    |
|  | Tongue Tear           | D-2261           | 20 LBF                     | 89 N                     |
|  | Trapezoidal Tear      | D-4533           | 25 LBF                     | 111 N                    |
|  | PPT Resistance        | D-2582           | 22 LBF                     | 98 N                     |
|  | Dart Impact Strength  | D-1709           | 1 LBS                      | 0.45 KG                  |
| Cold Impact Strength                   | D-1790                | -40°F            | -40°C                      |                          |
| Puncture Strength                      | D-4833                | 25 LBS           | 111 N                      |                          |

## FEATURES

- Non-migratory.
- Wash resistant.
- Very stable in a wide range of environments across a broad temperature range.
- Non-toxic and environmentally safe.
- Durable and tear resistant.

## ORDERING INFORMATION

### AVAILABLE COLORS:

White

### SIZES:

Standard rolls from 4' x 100' to 40' x 100' in increments of 4' widths are available for immediate shipment. Standard length and width tolerances are ± 1% (minimum 2")

### USABLE TEMPERATURE RANGE:

Minimum: -40°F -40°C

Maximum: 170°F 77°C

The information provided herein is based upon data believed to be reliable. All testing is performed in accordance with ASTM standards and procedures. All values are typical and nominal and do not represent either minimum or maximum performance of the product. Although the information is accurate to the best of our knowledge and belief, no representation of warranty or guarantee is made as to the suitability or completeness of such information. Likewise, no representation of warranty or guarantee, expressed or implied, or merchantability, fitness or otherwise, is made as to product application for a particular use.

**TOLLFREE 1.800.231.6074**

9209 Almeda Genoa Rd. • Houston, Texas 77075

P: 713.507.4251 • F: 713.507.4295

Email: [ri@reefindustries.com](mailto:ri@reefindustries.com)

