Understanding Mold-Resistant Coatings Testing

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ASTM G-21 and D-3273 are standards historically referenced by the coatings industry to demonstrate resistance of polymeric films to mold growth. These tests are very different in their protocols, and test coating performance under different conditions. Both tests are graded on a rating scale based on performance. This paper is designed to provide a greater understanding of the test methods referenced by mold-resistant coatings manufacturers.

ASTM G-21

Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi

ASTM G-21 is a test method that subjects specimens to lab conditions ideal for supporting microbial growth. A chip of the cured sample film is placed directly on nutrient agar in a petri dish, and then a mixed spore suspension is spread over the entire test surface, including the sample chip. The spore suspension is a mixed solution of Aspergillus niger, Penicillium pinophilum, Chaetomium globosum, Gliocladium virens and Aureobasidium pullulans fungi, designed to demonstrate broad-spectrum mold inhibition. After inoculation, the sample is then incubated for 28 days at conditions of at least 85% relative humidity and a temperature of 82-86°F, conditions ideal for supporting mold growth. At the end of the test period, the samples are rated on a scale of zero to four, with zero indicating no growth on the sample, and four indicating heavy growth (60% or more observed growth on specimen).

On completion, IAQ 6000 received the best possible rating of '0' when tested to the G-21 standard.

Fiberlock IAQ 6000 *ASTM G-21* testing by D/L Laboratories (39 days, 0-rating)

ASTM D-3273/3274

Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber

ASTM D-3273 is a test for coatings performed in an environmental chamber, and is designed to simulate a more realistic environment for microbial attack in indoor environments. Coating is applied to sample panels, and then those panels are

placed in a controlled environmental chamber for a period of four weeks at 95-98% relative humidity and 90±2°F temperature. Inside the environmental chamber, a layer of nutrient-rich soil and water is placed at the bottom of the unit, and a mold suspension is then used to inoculate the soil. The mold suspension used is a mixed culture of Aureobasidum pullulans, Aspergillus niger and Penicillium. The mold naturally sporulates and reproduces, growing on any viable surface including the test panels. At the end of the four week test period, the sample panels are evaluated on a scale of ten to zero, with ten indicating no growth, and zero indicating heavy growth. **When tested to D-3273, IAQ 6000 received a '10', the best possible rating under this test method.**

Fiberlock has always freely presented signed testing results provided by the independent laboratory conducting the test. Other manufacturers often do not provide any test reports other than in-house testing. When the Fiberlock IAQ line of mold remediation products was introduced, IAQ 6000 (8360) was tested to the ASTM G-21 and D-3273 standards on multiple occasions to prove the efficacy of the coating. All testing was performed by D/L Labs of New York, a nationally recognized testing lab that specializes in coatings testing, and holds multiple certifications and accreditations from numerous organizations, including the National Voluntary Laboratory Accreditation Program (NVLAP) and the National Institute of Standards and Technology (NIST). During one period of testing in late 2002 while running the ASTM G-21 method, photographs were taken by the testing lab to further document the performance of the products being tested. In addition to the test reports, Fiberlock has now made available photographs demonstrating the products efficacy during that testing.

Fiberlock mold-resistant coatings are engineered to be of the highest quality, and to provide maximum performance. Copies of ASTM G-21 and D-3273 test results and lab reports for IAQ 6000 follow. For more information on ASTM testing, Fiberlock products, or industry standards, please contact Fiberlock at (800) 342-3755.

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Accredited by National Voluntary Laboratory Accreditation Program - Lab Code 100252
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OBJECTIVE

To evaluate a coating sample for resistance to mold and fungal growth.

PRODUCT TESTED

The coating sample was submitted by Fiberlock and identified as:

383.81A, Fiberlock I-A-Q 6000™

PROCEDURES

The coating's resistance to mold and fungal growth was evaluated in accordance with the following ASTM test methods and procedures

1. **ASTM G 21**, "Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi".

   The coating was cast to produce a free film, then allowed to cure seven days before subjecting to the effects of a mixed spore suspension for 21 days.

2. **ASTM D 3273**, "Standard Test Method for Resistance to Growth of Mold on the Surface of interior Coatings in an Environmental Chamber".

   ASTM D 3274, "Standard Test Method for Evaluating Degree of Surface Disfigurement of P Paint Films by Microbial (Fungal or Algal) Growth or Soil and Dirt Accumulation".

   Two coats of the coating was applied to pine wood and allowed to dry seven days before subjecting the coating to the effects of the mildew chamber for 28 days.

TEST RESULTS

The submitted sample of 383.81A, Fiberlock I-A-Q 6000™ exhibited the following result:

Fungus Resistance		
ASTM G 21	No Growth	0 Rating
ASTM D 3273/3274	No Growth	10 rating

NOTE:

ASTM G-21 Observation of Visible Effects

Observed Growth on Specimens	Rating
None	0
Trace of growth (<10%)	1
Light growth (10 – 30%)	2
Medium growth (30 – 60%)	3
Heavy growth (60 – 100%)	4

ASTM D 3274 Photographic Reference Standards

Disfigurement by Particulate Matter	Rating
No disfigurement	10
Slight disfigurement	8
Moderate disfigurement	6
Considerable disfigurement	4
Complete disfigurement	0

DL Labs, Inc.

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