

Mold and Mildew Resistance of Nyloboard Composites Compared to that of Standard Building Products

A study conducted by Nyloboard, LLC.

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Introduction

In addition to causing human health problems, mold and mildew can cause damage to wood and wood-based materials. In humans, mold and mildew are responsible for many allergies and can also cause or trigger asthma attacks.ⁱ On wood and wood-based materials, such as plywood, fiberboard, OSB and wood plastic composites, mold and mildew can cause surface discoloration as well as degrade material in the board itself, leading to rot.ⁱⁱ The purpose of this study was to compare the mold and mildew resistance of five industry-standard construction products with that of Nyloboard's products.

Basis of the study

The study compared the mold and mildew resistance of six products: 1) gypsum board, 2) CDX standard plywood, 3) medium-density fiberboard (MDF), 4) Nyloboard composite board, 5) oriented strand board (OSB), and 6) pressure-treated plywood (PTP).

Mold and mildew need moisture and nutrients to grow. The nutrient source on wood and wood-based decking materials is normally the cellulose in the wood and dirt and pollen on a deck's surface. Since Nyloboard and NyloDeck is made with 100 percent post-consumer recycled carpet fiber and contains no wood or cellulose, it was theorized that it would not be susceptible to attack by mold and mildew.

In the study, Nyloboard was tested side-by-side with the five industry-standard construction products mentioned above. The products were placed on edge in a clear glass aquarium (Fig. 1). The test container was partially filled with standard city tap water to the same level and sealed (no chemicals were added). Each test board was separated from the others by a clear Plexiglas partition (Fig. 2), which prevented water in the aquarium from seeping between test boards. The aquarium was kept at room temperature for 30 days, during which time it was exposed to standard industrial lighting.

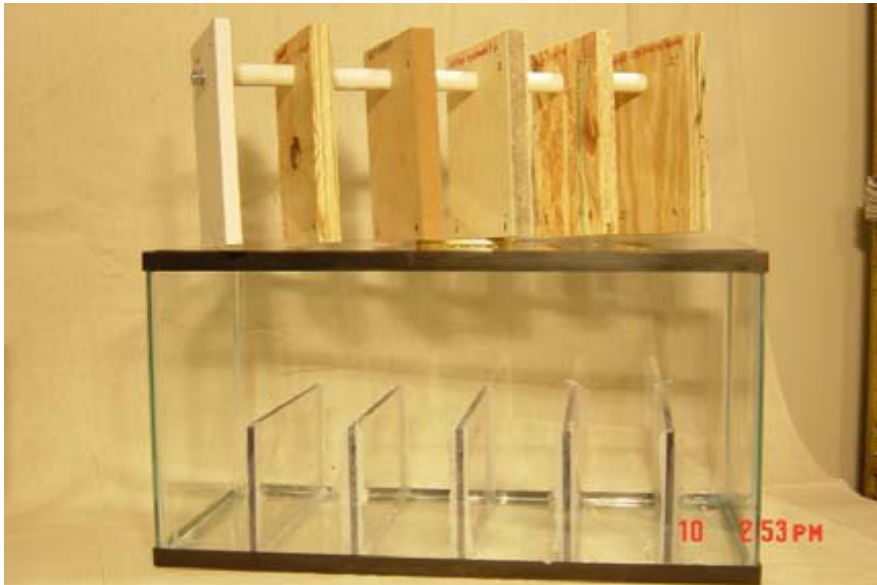


Figure 1: Test samples (L-R) gypsum board, CDX plywood, MDF, Nyloboard, OSB, Pressure treated plywood

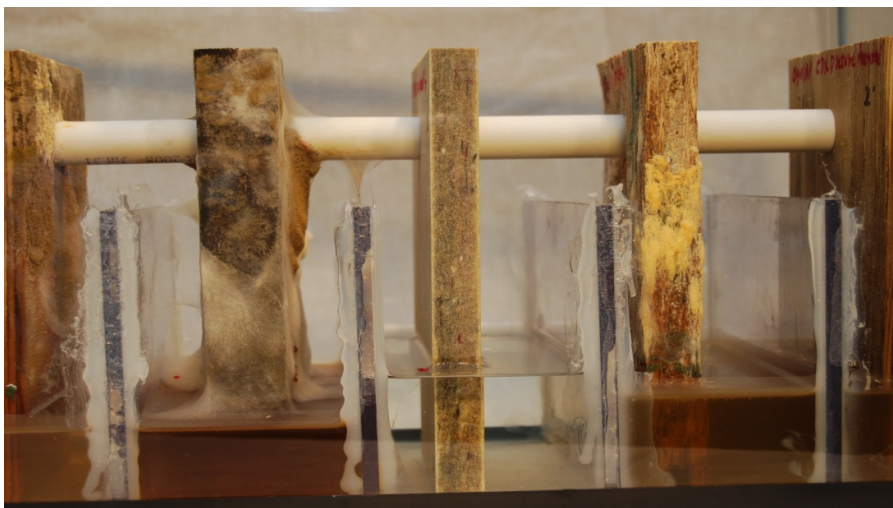


Figure 2: Test samples immersed in water. Plexiglas dividers prevent water movement between samples

Results of the study

After 30 days, the test boards were removed from the aquarium and examined (Fig. 3). With the exception of the Nyloboard, all five of the standard building products exhibited edge swell, substantial mold and mildew growth and water absorption. The MDF board gained the most weight and had the most extensive mold growth, 163.1 percent and 100 percent, respectively. Nyloboard had virtually no weight gain and zero mold growth, 1.3 percent and zero percent, respectively. The results of the test are summarized in Table 1.



Figure 3: Test samples after 30 days in testing tank. Note mold growth on all the boards except Nyloboard (fourth from left)

Table 1: Summary of test results

Test sample	Total weight increase	Caliper increase	Water level drop in test compartment	Mold growth* (above water)	Water color** (1 clear – 5 opaque)
Gypsum Board	44.4%	2.3%	27.3%	53.3 %	2
CDX plywood	73.7%	8.9%	29.5%	88.3%	3
MDF	163.1%	63.7%	31.8%	100.0%	5
Nyloboard	1.3%	0.1%	2.3%	0.0%	1
OSB	68.6%	36.9%	20.5%	80.0%	4
Pressure-treated plywood	50%	4.8%	20.5%	5.0%	4

*Mold growth is a visual estimation of the amount of material with mold compared to the total amount of material above the water line.

**Water color is a visual estimation with 1 being clear and 5 being opaque.

Wood-Plastic Composites and Mold and Mildew Growth

Wood-plastic composites (WPC) were not part of this study. However, because they do contain wood and/or other organic components, they are proven to be nonresistant to mold and mildew unlike a non-wood composite deck board such as NyloDeck.

ⁱ Lord, Noelle. "Mold Management." *Old-House Journal* Vol. 37, No. 2 (Mar-Apr 2009): 67.

ⁱⁱ Trechsel, Heinz R., Editor. *Moisture Control in Buildings:* American Society for Testing and Materials, 1994, 87.