

# Coatings Consultants Inc.

Telephone 561-775-7151

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8211 Needles Drive, Palm Beach Gardens, Florida 33418

## ORGANIC IS NOT ALWAYS GOOD

By Bob Cusumano

Mildew, mold, fungi, algae; although there are scientific differences, they mean the same thing to the painting contractor- PROBLEMS. Mildew is a type of mold and may be black, green red, or white in color. Molds are simple plants that are a part of the broad plant group known as fungi. Fungi are plants that do not contain chlorophyll, the green component that allows most plants to create their own food. Instead, fungi must absorb their food from other sources. Unlike fungi, algae are simple, plant organisms that do use the energy of sunlight to make their own food through photosynthesis. Algae may form mutually beneficial partnerships with other organisms like fungi. But enough about botany, let's discuss how this all affects our industry. In this article, we'll use the term mildew as a generic term to include all of the aforementioned organisms.

Mildew flourishes in warm, humid environments. However, although more prevalent, it is not confined to southern climates. Mildew growth can be a problem in northern climates as well, growing in the summer and resisting cold temperature in the winter. Surfaces that remain damp for long periods of time, such as pores or crevices and north building elevations away from the sun are more prone to mildew. Since mildew does not create its own food, it must receive nutrients from other sources. Oil in alkyd paints and stains serves as food for mildew and therefore surfaces painted with these products are more likely to mildew than those painted with latex paint. Rough surfaces, like textured stucco or rough sawn wood, hold food nutrients and are therefore more likely to mildew than smooth surfaces. Harder, glossier finishes are less likely to hold nutrients than softer, flat finishes. Therefore, a surface painted with an acrylic semi-gloss is likely to mildew than one painted with an acrylic flat. Areas of structures that do not get good air flow and circulation, like behind bushes, are more likely to mildew than open areas.

Mildew growth, such as that shown in photo #1 is often confused with dirt collection on soft exterior coatings like elastomerics as shown in photo #2. One way to discern between the two is to look at the surface through a magnifying glass.



Photo 1



Photo 2

Mildew has a fluffy appearance that is sometimes cob web like with thin threads visible. Photo #3 shows mildew under a low power microscope. Surface dirt, on the other hand, is composed of individual isolated dark dots as illustrated by photo #4.

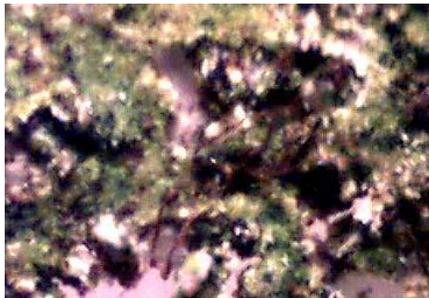


Photo 3

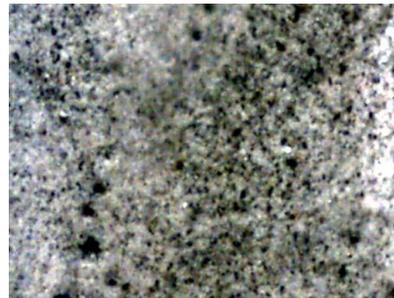


Photo 4

Another way to tell the difference between dirt and mildew is to dip a cotton ball in sodium hypochlorite (pool bleach) and place it on the affected surface. After several minutes of exposure, remove the cotton ball and look at the surface below. If the discoloration has greatly lightened in color or disappeared, then the surface contaminant is organic in nature and therefore mildew. If the discoloration is unaffected by the sodium hypochlorite, then the surface contaminant is dirt.

Prior to repainting, mildew should always be killed and the resultant debris removed. Sometimes painting contractors need to remove mildew from surfaces that they have painted that are still under warranty. Mildew can be treated by washing the affected surface with a diluted bleach solution consisting of one volume of chlorine to three volumes of water. Approximately two thirds cup of trisodium phosphate (TSP) and one cup of detergent can be added to each gallon of diluted bleach solution. This solution should be applied and allowed to remain on the wood for approximately 30 minutes of reaction time. After this treatment, the surface should be flushed thoroughly with clean water by pressure washing. Products are commercially available that contain a bleach activator and detergent and when combined with bleach creates a solution that is effective for mildew removal.

Unfortunately, mildew can grow into paint and sometimes through it into the substrate below. On some occasions you may be faced with situations where another painting contractor has painted over mildew without first treating it as indicated above. This situation is depicted in photo #5. When that occurs, the existing coating must be removed, often best accomplished by chemical stripping. After removing the existing paint, the mildew needs to be killed before repainting is performed.



Photo 5

In a recent case, wood soffits were found to be exhibiting wide scale mildew growth after a short period of time. Photo #6 shows a typical section of the building.



Photo 6

The specified paint system consisted of one coat of alkyd primer followed by two coats of acrylic gloss. It was determined that instead of the specified system, the painting contractor applied two coats of flat latex. The "stripe" is a seam between plywood boards that has been floated with joint compound. Note that the mildew generally follows the grain pattern of the wood. Also note the relatively clean "stripe" between the red arrows. It is our opinion that these phenomena have occurred due to the fact that the flat latex applied does not adequately seal the wood and therefore moisture present from "green wood" can escape, encouraging the growth of mildew. Due to the added thickness at locations where the joint compound was applied, mildew growth was less likely to occur. There is no question that the location of this building and the "swampy" surrounding conditions contribute to the mildew conditions encountered. We recommend that when remedial painting is performed, the following be considered. Mildewcides are chemicals that are added to paint to retard mildew growth. For many years, mercury and other heavy metals were effective for this purpose. When the use of these mildewcides was discontinued to safety hazards, effective alternatives had to be developed. Mildewcides are expensive and add significant cost to the particular paint product to which they are added. Manufacturers always try to answer the question "how much is enough" attempting to balance the increased cost with product quality. This is particularly difficult when paint products are manufactured for use at all areas of the country that have different temperature and humidity environments. In some instances, it is warranted to purchase and add extra mildewcide to the paint being applied due to the location of the building.

We are often asked to examine mildew growth on painted concrete roof tiles. The mildew growth usually emanates from rough, unfilled, and unpainted porous areas particularly at the butt edges of the tiles as shown in photo #7.

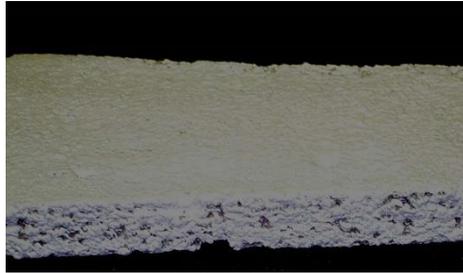


Photo 7

The roughness and "porosity" of the edges varies from tile to tile are rough as result of the manufacture of the tiles. Mildew growth is enhanced at these pores because the areas remain wet longer and collect dirt. The method of paint application sometimes plays a role in the growth of mildew on the roof tiles. The paint usually is applied by spraying. This method causes the paint to lie on the surface and is not "worked" into voids and crevices. When the application is by brush or roller, the paint is forced into pores and surface defects and complete coverage is attained. Applying the paint by spray and then back-rolling or back-brushing is satisfactory. This is especially important on the butt edges of the tiles. In some cases, filling the butt edges with a cementitious slurry prior to painting would eliminate the problem.

Painting contractors are often faced with situations in which mildew is a problem. Understanding the factors that encourage mildew growth and learning methods and products effectively control mildew will keep your customers happy.