

PVC Membranes

MONOLITHIC VERSUS LACQUER-COATED TOP PLY

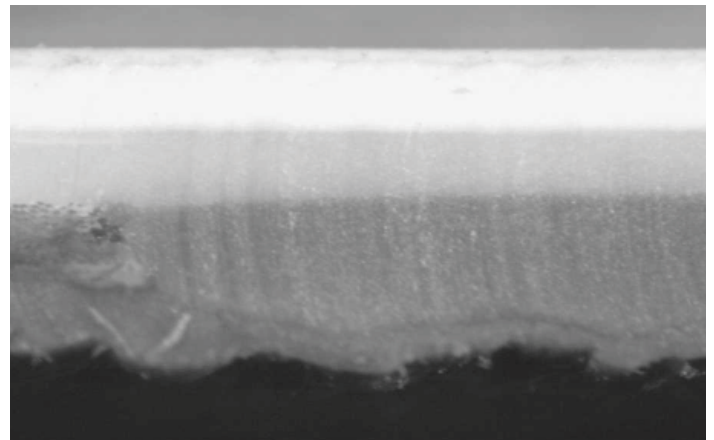
Some manufacturers of PVC roofing membranes apply a lacquer coating (approximately two mils thick) to their sheet. The stated purpose of this lacquer coating is to mitigate plasticizer loss, reduce the effects of weathering, and (initially) keep the membrane cleaner and free of biological and fungal growth. However, these benefits are short-lived because lacquer coating wears off within the first few years of exposure to the elements.

Geographical location and other project-specific factors can have a dramatic impact on the decomposition of lacquer coating. Exposure to hydrocarbons, greases, acids, and pollutants can drastically accelerate this decomposition.

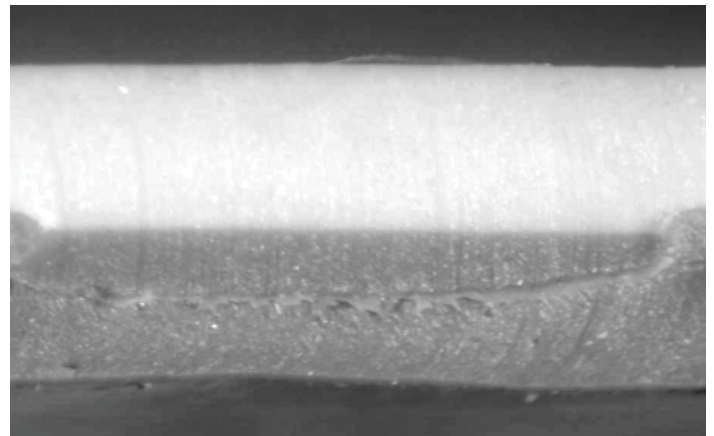
Ideally, PVC membranes should have a monolithic top layer (commonly referred to as “membrane over scrim”) that contains all the necessary weathering compounds for long-term performance. But lacquer-coated PVC membranes have a multiple-ply – as opposed to monolithic – top layer that is comprised of two distinct layers of film, each with a different chemical formulation.

These multiple-ply constructed membranes’ top ply consists of a thin top layer of fully formulated compound, followed by a second layer that lacks the weathering properties necessary for long-term exposure. Reducing the content and amount of weathering ingredients means more emphasis must be placed on protecting the membrane from exposure, hence the temporary lacquer coating.

Pictured below is a membrane comprised of an ultra-thin lacquer coating over 13-15 mils of weathering compound over 11-13 mils of a compound that contains less of the weathering ingredients and has a more transparent appearance.



Manufacturers of high-quality PVC formulate and build a roofing membrane with a monolithic top ply. Because these higher-performance membranes contain up to 50% more anti-weathering ingredients in the top ply, they are able to offer a higher degree of protection and improved performance over a longer period of time. Below is one such membrane. Note the significant increase in top ply thickness, the monolithic nature of the top ply, and the equal thicknesses of the top and bottom plies.



OXIDATION PROCESS

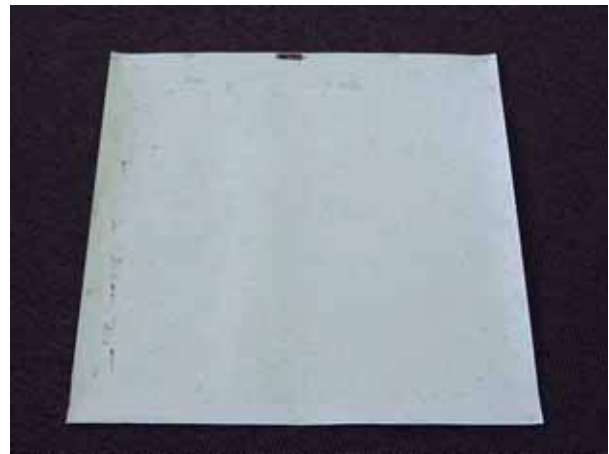
PVC membranes begin a process of oxidation upon exposure. This oxidation protects the membrane while the anti-fungal and anti-bacterial ingredients perform their intended functions. In lacquer-coated membranes, the oxidation process is delayed until the coating wears off. Once the lacquer coating is no longer protecting the sheet, the membrane is susceptible to rapid mold and mildew growth, leading to faster aging and deterioration of the sheet. Combine this with a multiple-ply top layer that provides limited weathering protection and you have the potential for premature failure of the roof membrane.

The photographs below show a PVC sheet with a multiple-ply, lacquer-coated top ply alongside a PVC sheet formulated with a monolithic top ply. The two sheets were placed side-by-side on a rooftop in Florida to compare the effects of exposure. As seen here, after two years, the lacquer-coated membrane on the left has significantly more fungal growth and dirt pickup.

Exposure After 2 Years (Florida Test)



PVC membrane with a lacquer-coated top ply



PVC membrane with monolithic top ply