



April 2013

## Alligatoring of the Membrane



### What is "alligatoring," exactly?

Alligatoring is the term used to describe the roof condition pictured above, mainly because it looks very similar to an alligator's hide. Appearing on smooth-surfaced built-up membrane roofs, the shrinking and cracking of the surface bitumen is often due to ultraviolet radiation and the subsequent embrittlement of the membrane. Alligatoring also occurs on some coatings. The pattern is made up of cracks in the surface. (If the cracks are very small, the condition is referred to as checking.) The cracks sometimes extend through

the surface bitumen or coating.

The cracks intensify, allowing moisture to enter the roofing system. The moisture can travel throughout a flat roof, which can cause leaks that are located far away from the actual source of entry. Water, as we know, expands and contracts as it freezes and thaws. As this occurs underneath the roofing surface, the cracks will grow in size. As the surface fails, the underlying felts become exposed and brittle. Roofing system failure follows. Water damage is accelerated in areas which also contain ponding water.

#### **Ultraviolet Radiation:**

The modified bitumen membranes offer excellent resistance to ultraviolet radiation, however, after long-term exposure, they begin to fall victim to photo-oxidation attacks.

The top surface of the asphalt contains volatiles. Volatiles keep the asphalt flexible so that it can react with environmental stress (the membrane contracting with cold weather and expanding with warm). The sun essentially "boils" off the volatiles in the top layer.

When the sun, especially in warmer climates, hits the roofing membrane the photo-oxidation attack accelerates as temperatures rise. The estimate is that it doubles with each 18 degree Fahrenheit temperature increase. A roof can easily reach 175 degrees F in a region with a "normal" summer high temperature of 105 degrees F and high solar radiation levels. An exponential increase of this magnitude illustrates the importance of a heat reflective surface. The above image is from a facility within a mountain range where the average summer high temperature is 88 degrees F and a relatively low solar radiation level.

#### **Erosion:**

On some roofs, gravel or small stones are used as a ballast to cover the membrane. Water running across a roof, or wind, can move and erode gravel. Once the asphalt is exposed, it can quickly succumb to the photo-oxidation attacks.

#### **Solution:**

Allow LaFerney Commercial Roofing to provide a free evaluation of your roof. Our consultants can identify concerns such as alligating and provide a custom solution for your roof. In most instances a single-ply PVC roofing membrane is the optimal solution. This is a durable material with high solar and heat reflectance. Concerns with leaks due to alligating will no longer exist.

[Click here to learn more](#) or call 800-633-3119.

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# April Trivia

- April 3, 1860 marked the beginning of the Pony Express.
- General Robert E. Lee surrendered to U.S. Grant on April 9, 1865, ending the American Civil War.
- April 15, 1912 is the date the R.M.S. Titanic hit an iceberg and sank.
- On April 19, 1775 the American Revolutionary War began.
- The first public television broadcast was made from the Empire State Building on April 30, 1939.

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