



# SAFE ENCASUREMENT SYSTEMS-MIDWEST

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## BLISTERING - CAUSES AND REMEDIES

**PROBLEM:** Blisters or bubbles occasionally develop soon (a few hours to a few days) after applying somewhat elastomeric topcoats. If pressure is applied to the blister with a finger, especially when the surface is exposed to direct sunlight, the blister gives way or yields to a some extent, much like the bubbles in bubble pack packaging. Blistering is more common with darker colored topcoats. After the surface area in question is no longer exposed to direct sunlight and the surface has had a chance to cool, the blisters will usually contract slightly, sometimes nearly completely.

**CAUSES:** Water or volatile thinners (co-solvents) used as part of the formulation of the topcoat have not adequately "breathed" out from the wet film of topcoat, though the outer surface of the topcoat has "skinned over" enough to resist this important part of the paint drying process. This is usually caused by painting in direct sunlight and at temperatures higher than 80-85 degrees F. It can be exacerbated by the use of darker colored topcoats, which absorb more of the sun's energy than lighter colored topcoats. This absorbed energy raises the temperature and consequently the vapor pressure of all volatiles remaining in the drying paint film, and contributes to a more rapid skinning over of the outer surface. Other exacerbating factors are the moisture content of the surface to be painted, including any primers used under the topcoat and their "dryness levels", and the substrate under the primer and old paint. Possible causes of excessive moisture include significant recent rains and or power washing that have left the wall surfaces wet at the time of topcoat application, water intrusion problems due to poor flashing or roofing problems, or any other reasons for the substrate having more than its normal level of moisture.

With topcoats that are substantially non-elastomeric, the causes discussed above often lead to cracking of the topcoat sooner or later.

**REMEDIES:** Using a sharp utility knife, cut and peel off the blister and any other loose topcoat in the immediate vicinity of the deformation, and leave it to breath for a few sunny days. Once this step and the blistering has stabilized, recoat these areas with topcoat, taking care not to repeat any of the causes of blistering problems mentioned above, including following the sun in picking the time of day to paint, resolving all moisture intrusion issues, etc.

Blistering problems are not related to the choice of primer. In fact, they are related to the permeability of the topcoat to water and/or solvent vapor. The vapor generated within the film during rapid drying cannot escape as fast it develops, resulting in pressure development under the topcoat that causes blisters to be formed.

**NOTE:** Attached is an internet search reference guide on blistering. These and all other sources of information that have been examined indicate that painting in direct sunlight is by far the leading cause of blistering or bubbling.