

Amine Blush & Cured Epoxy

Amine blush, sometimes referred to as “bloom”, forms when amines in the hardener react with carbon dioxide and moisture in the air. Amine blush can appear as a wax-like film on cured epoxy surfaces, and may be more noticeable in cool moist conditions.

It's a good idea to assume it has formed on any cured epoxy surface.

A thorough understanding of blush is helpful in developing work habits that maximise the performance of epoxy resins while minimising inconvenience. There are effective ways of dealing with blush to keep projects moving along smoothly.

Gougeon Brothers Inc, USA, have found that the same components that promote WEST SYSTEM®'s strength and toughness also contribute to the formation of blush. Balancing an epoxy's physical strength, mechanical properties and handling characteristics is a difficult task when formulating for the marine market. A slight change in chemical formulation can have a dramatic affect on the overall characteristics. Components used in WEST SYSTEM® epoxy have been carefully selected to achieve the long-term, high-strength performance that it is known for.

Blush is water soluble and can be removed with an abrasive pad and water, after the epoxy has cured hard. Scotch-Brite pads or similar abrasive scouring work well for abrading and dulling the shiny surface. Detergents and solvents are not required, or recommended, for removing blush.

Blush tends to clog sandpaper. Cured epoxy coatings sand much better after they have been washed with water. If not dealt with properly, however, blush can cause adhesion problems with subsequent coatings applied over it. Amine blush can also interfere with the cure of some paints, varnishes, and all polyester gelcoats.

You can eliminate the inconvenience of washing and sanding between coats by applying subsequent coats of epoxy while the previous coat is still tacky to touch (wet-on-wet). This window of opportunity for re-coating can vary from 15 minutes to several hours, depending on the hardener chosen and the working temperature.

Once the surface has cured hard to touch, re-coating is not recommended, even in a dry climate, until the blush is removed and the surface is abraded. Amine blush is most evident when a coating cures while the temperature is dropping. Maintain a constant temperature in the work area as epoxy cures, to help minimise the potential for blush to develop.

Release fabric (peel ply) can be used in some instances to reduce the amount of surface preparation necessary before re-coating. Apply and squeegee the release fabric over the surface of the uncured epoxy. After the epoxy has cured, remove the fabric and the surface will be free of blush and have a textured surface that requires little or no sanding. This method is used most often when laminating several layers of fibreglass that cannot be done in one session, or in specific areas where something will later be bonded.

The following tips can help minimise amine blush:

1. Avoid working in very humid conditions. More blush forms when there is a lot of moisture in the air.
2. Work above 18°C. The epoxy cures slower in cool temperatures and allows more blush to form.
3. Use WEST SYSTEM® H205 Fast Hardener when the temperature is below 22°C. H205 can be used in warmer temperatures if you don't need a lot of working time.
4. Stir the epoxy thoroughly to evenly disperse the hardener in the resin.

NOTE When in doubt as to whether the epoxy has cured too far for re-coating, it is always better to be conservative. Allow the epoxy to fully cure and then wash and sand the surface before re-coating, rather than risk a possible failure.