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## LIKE A MOVIE STAR, YOU WANT TO AVOID DEFECTIVE FILMS

By Bob Cusumano

Paints and coatings are applied for two reasons; to protect the surface or substrate to which they are applied and to beautify. The loss of either of these conditions would be considered a defect. There are many different types of paint failures with some of them beyond the control of the painting contractor. This includes situations where an improper paint system is specified by others for a particular exposure. However, the painting contractor can avoid the many paint film defects that are associated with application deficiencies. In this article we'll discuss some of these situations and the causes.

There are numerous painting failures that involve improper coating thickness. While it is not possible to field apply a coating at a totally uniform thickness, it is important that the painting contractor know the coating manufacturer's recommended wet and dry film thickness ranges and make a concerted effort at compliance. This involves the use of application equipment that is appropriate for the type of paint and surface to which it is applied and the use of wet and dry film gauges and measuring surface area versus material gallonage used.

Paint coverage that is too thin can result in improper protection of the substrate and depending on the substrate, lead to such defects as incomplete hide or transparency, missed spots or holidays (photo 1), premature rusting, alkali burn (photo 2), and premature chalking.



Photo 1



Photo 2

In our industry, more is not necessarily better. Coating thickness that is too thick can also result in various deficiencies. Mud cracking is a defect that resembles the appearance of dried mud (photo 3). Mud cracking often occurs when a coating is applied at greater than its recommended dry film thickness and the top surface of the paint dries faster than the underlying coating. This creates stress on the surface of the film, resulting in cracks.



Photo 3

Runs, sags, or curtains (photo 4) are terms used to describe paint film defects that result when paint moves downward due to gravity before setting on a vertical or angled surface. These defects are usually the result of applying the coating at an excessive thickness or thinning the coating beyond its recommended amount. Wet or extremely humid conditions can contribute to

this phenomenon when latex paints are applied. These defects can also be the result of application to a surface that is hard and glossy. In this instance, the surface cannot adequately “hold” the paint and must be abraded prior to painting.



Photo 4

Many coatings, particularly latexes, have the ability to “breathe” or allow water vapor to pass through them. This is a desirable property when the substrate beneath the paint has a high moisture content. Applying these coatings at too great a thickness, however, will compromise this ability. As the thickness increases, its like trying to breathe when you are progressively pinching your nose closed. You may not suffocate, but you certainly can’t run a marathon! When the permeability of the coating is compromised due to excessive thickness, then peeling may result because the moisture cannot escape through the film.

Pinholes are small voids in a coating film, often extending to the substrate (photo 5). When a coating is applied too heavily, then the solvent in the coating may become trapped. When the solvent escapes and the paint has already set to the point where it will not flow into the defect, then pinholes will occur. Other causes of pinholing include trapped moisture, insufficient or contaminated spray application, and trapped air during application. Pinholes will compromise the coatings ability to protect the substrate. This is particularly concerning when the substrate is susceptible to external influences that can cause corrosion of the substrate in the case of rust or water intrusion.



Photo 5

Craters are deep depressions, but unlike pinholes, they do not extend through the coating film. While the protective qualities may not be severely compromised in these instances, appearance often is. Craters will reflect light differently as compared to adjacent areas where the coating is smooth. This can result in a darker appearance. Craters are also capable of trapping and holding dirt, moisture and other contaminants which can lead to mildew growth in exterior applications or compromise the appearance due to discoloration (photo 6). This phenomenon often occurs with thicker coatings like elastomerics.



Photo 6

There are also various defects that are attributable to the paint application equipment utilized. Brush marks are closely spaced ridges and valleys visible in the painted finish (photo 7). These may be caused by brushing on a viscous paint without properly thinning the material or using the wrong thinner, using poor quality or worn brushes that do not level the paint, or brushing on the paint under environmental conditions that cause it to dry too quickly to allow self leveling of the material.



Photo 7

Application of paint by rollers can also lead to a texture difference known as roller stipple. While this condition may be desirable for helping to hide surface defects when painting substrates like drywall and plaster, roller stipple results in an aesthetically undesirable appearance when on surfaces like doors and trim where a smooth appearance is generally expected. The use of shorter nap covers or foam roller covers can reduce the amount of roller stipple as well as thinning the material to extend the set time. Once again, applying paint under conditions that cause it to set up too quickly will contribute to this problem.

As is the case with brush and roller application, application of paint by spraying can result in uneven paint application that causes visual defects. Spray marks can result from improper application techniques or the use of worn spray tips (photo 8). The potentially most expensive spray defect is failing to control overspray and causing damage to nearby vehicles, boats, and other expensive property.



Photo 8

Some situations are beyond your control, but the professional painting contractor can provide proper training to employees and employ application monitoring techniques to ensure that the paint applied is in accordance with the coating manufacturer's specifications and industry accepted standards. Careful attention to application detail will allow the painting contractor to avoid the defects discussed in this article.

The time to recognize a potential problem with the coating is at the beginning of a job, not at the end. Shortly after having personnel begin a certain task, take the time to assess whether the desired result is being achieved and if not, correct the situation then. A benchmark sample for approval prior to proceeding with a project is a great idea. That way, everyone concerned knows what is expected as a finished product.