



## Paint Finishes and Primatect®

### General

Paint systems are available in many different forms, two of which are liquid and powder. Many paint types are available in both liquid and powder form, but the application process and resulting surface protection are quite different. Liquid paint relies on a solvent to carry the proper materials to the surface of the item to be coated. These solvents evaporate and leave a coating on the object. Powder coatings use no solvents and rely on a static charge during application to deposit material on the item to be coated. The powder coating is fused onto the surface through a heating process that "melts" the paint to form a cross-linked, even layer.

Powder coatings offer a superior coating because the cross-linking that occurs during the heating process "locks" the paint molecules together and also binds them to the substrate. The interlocking of paint molecules to other paint molecules and to the substrate results in protection from external elements that would otherwise initiate corrosion. Liquid paint undergoes a different process as the solvents evaporate that results in much weaker bonds.

The process described above is a simplified view of what happens during the painting process. Numerous steps must be followed to ensure a coating that will adhere to the surface and provide necessary protection. To provide a final product that will operate properly in a real-world environment, the base material, the coating material and the coating application process must work in harmony. The following steps and components must be addressed for a reliable paint protection system:

- Environment
- Substrate
- Cleaning
- Pre-treatment
- Sealing
- Coating
- Curing

Although substrates and surface preparation are topics of other discussions, they are important factors in a coating system that meets environmental demands. Of concern here is Primatect and its performance relative to the standard paint offered by Holophane. To form a better understanding of performance, a brief discussion of some available powder paint types is useful.

### Acrylic Paint

A common coating is acrylic paint. Acrylic coatings are not susceptible to damage from ultraviolet light, therefore chalking is virtually non-existent. However, the corrosion protection of an acrylic coating is rather poor due, in part, to the low adhesion of acrylic to metallic surfaces. Because one of the main reasons for applying a coating is to control corrosion, acrylic alone is a poor choice for luminaires.

Acrylic paints are not very flexible, so their coatings are prone to cracking and peeling when the surface is dented or bent.

### Epoxy Paint

Epoxy-based paints can adhere very well to a metallic surface if that surface is prepared correctly. Because of its bond to a metallic substrate and the internal bonds in the paint itself, epoxy is an excellent coating to control corrosion. However, epoxy paint systems have a major problem dealing with ultraviolet light - the material decomposes, causing what is known as chalking. Chalking makes an epoxy coating look very dull after a very short exposure to sunlight. Chalking is also an erosion of the material, which will eventually cause the paint to lose its corrosion protection as well.

"Epoxy" has become a term in general use without specific definition, so a coat-

ing referred to as "epoxy" may contain a very minor proportion of the actual epoxide, and still qualify for the name. But a coating which has only a small fraction of epoxy will also have only a small fraction of epoxy's benefits and be a much poorer performer than the term implies. For this reason, polyesters often provide better corrosion protection than some coatings called epoxy.

## /// **Polyester Paint**

Polyester paints, especially formulations that contain TGIC (triglycidyl isocyanurate), combine good corrosion properties, good surface adhesion with durability of appearance and mechanical strength to provide an excellent coating for luminaire systems. TGIC polyester does not chalk, bonds to the surface of luminaires so hard that sandblasting is necessary to remove it, and has flexibility so it does not fail if the substrate is dented or bent.

TGIC polyester powder paints applied by electrostatic to surfaces that have been properly pretreated with phosphate have proven their durability in numerous exposure tests. In outdoor applications, the TGIC polyester normally outperforms epoxy systems. Indoors, there is no difference in the response of the epoxy and TGIC polyester paint to corrosive environments.

It is because of the superior characteristics of the TGIC polyester that Holophane originally chose this material for its finish system, and continues to use it today.

## /// **Holophane's Paint Process**

To construct an outstanding finish system, proper choice of the coating material is critical. Twenty years ago, Holophane used liquid paint exclusively. At that time, liquid was the mainstay of the painting industry, and powder paints were not fully developed and not generally available. To provide the best corrosion system at that time, Primatect was introduced. It used a wet epoxy primer coat and a UV protective overcoat of regular paint.

In the 1980's, Holophane invested significant time and money to bring a TGIC polyester powder paint facility on line, providing a significant improvement in paint quality and corrosion protection. The durability of this powder system was, and still is, better than the epoxy coating that was developed to address liquid paint issues. The Primatect offering was continued due to customer demand carried over from liquid paint specifications. The liquid epoxy material was changed to powder to be compatible with the application processes in place for the TGIC polyester. The nature of the epoxy powder coating makes it quite difficult to apply an overcoat to this paint; it is so hard and smooth that adherence of an overcoat is unreliable.

Because an overcoat of the epoxy is not reliable, it has been eliminated from the Primatect process. Given the chalking tendency of epoxy when exposed to UV,

Primatect is now only suggested for indoor applications where the customer will not utilize the standard, high quality TGIC polyester finish.

Holophane's finishing system is outlined below. The first seven items encompass the pre-treat process and the last three describe the paint application.

1. Clean
2. Rinse
3. Activate surface
4. Phosphate application
5. Rinse
6. Seal
7. De-ionized water rinse
8. Dry
9. Electrostatic powder coat
10. Cure (bake)

## /// **Specification - Primatect Finish**

The following is suggested for use by customers that still believe that epoxy paint is necessary for their application:

Finish shall be a pure epoxy powder paint applied by an electrostatic coating process over a substrate that has been prepared through a seven stage pretreatment process. Pretreatment shall include a phosphate application and deionized water rinse to ensure proper coating adhesion and corrosion protection.

## /// **Summary**

The standard Holophane polyester TGIC paint system provides superior corrosion protection from environments encountered by lighting products. In virtually all applications, this finish should meet customer performance requirements. For those customers that will not accept anything other than an epoxy coating, Holophane will provide a powder epoxy coating for those luminaires that allow a "CR" option. Because of the chalking potential of epoxy, the coating will be for indoor applications only.

If a customer demands an epoxy finish for an outdoor application, Holophane TSG will need to be consulted.

Holophane continues to offer the best finishes available in the industry. This Primatect change in no way reduces the performance of our products.