

It's All About the Application

By Amanda Fisher

Limit coating toxicity
with proper application

Recently I learned that fire hydrants use a color-coding system to indicate the flow rate a hydrant can deliver. Hydrants with light blue-coated bonnets and nozzles deliver the fastest flow rates, 1,500 gal per minute (gpm) or greater, while hydrants with red-coated bonnets and nozzles deliver 499 gpm or less. Coatings are amazing products—not only are they aesthetically pleasing, they also provide surface protection or improvement and can convey important information to the end user.

Although fire hydrants are not in the drinking water pathway, coatings are used on many types of products that do contact potable water: tanks, pipes, valves, pumps, meters, fittings and service saddles, to name a few. Because these products are in contact with water intended for human consumption, it is important that whoever applies the coating uses a product certified to NSF/ANSI Standard 61. Coating manufacturers that certify products to this standard carefully formulate them and devise application instructions to ensure they deliver the lowest amount of impurities to water.

The public often focuses on specific contaminants of health concern. Lead paint has been a major issue on children's toys coming from China. Bisphenol A (BPA), used in many epoxy coatings, is a controversial contaminant due to its ability to act as an endocrine disruptor. Although lead and BPA are of toxicological concern, it is important to understand that most metals and chemicals have some level of toxicity.

Coatings are made from a variety of materials: epoxy, polyurethane, asphalt, cement, polyester and more, all of which can impart impurities to water. When used for potable water, it is crucial to not only select an NSF/ANSI 61-certified product, but also to follow the manufacturer's instructions to ensure proper application. Following are some of the key parts of the application process that can affect the toxicity of a coating.

Preparation

Coating manufacturers will tell you that surface preparation is the most important aspect of applying a coating. As far as toxicity is concerned, an ill-prepared surface or incorrect substrate will not necessarily increase the amount of chemical leaching, but it will increase the chances of the coating bubbling or peeling and falling into the water.

The material the coating covers may be more toxicologically significant than the coating itself, and could become exposed to drinking water. Therefore, when a coating is recommended for steel only, it should only be used on steel that is cleaned and blasted according to the manufacturer's recommendations.

Cure Time

Cure time is defined as the amount of time from when the last coat is applied to when the product can go into service. For some coatings, such as those that are powder based, cure time is not much of an issue. However, for solvent-based coatings, cure time can range anywhere from minutes to days.

Just because a coating is dry to the touch does not mean that it is fully cured. As a solvent-based coating dries, it will release volatile compounds into the atmosphere. If the coating is prematurely submerged, those compounds will be released into drinking water.

Recoat Time

Recoat time is the amount of time to wait before applying a second or third coat of paint. Like cure time, this is an issue for solvent-based coatings. If the first coat does not cure completely and a second coat is applied, more contaminants will leach out of the coating into the water. This can happen even if the proper cure time is followed after the final coat.

Thinners

Some coating manufacturers recommend using a thinner with their products to aid in the application process. Although thinners can make application or cure easier, adding a thinner means adding additional solvent to the product. The more solvent added, the more likely volatile organics might leach from the coating into potable water. Manufacturers recommend a maximum percentage of thinner by weight or volume to use with the coating, which should not be exceeded.

Film Thickness

Film thickness is the thickness of a coating, often measured in mils. Coatings are not always easy to apply, leading to a variation in the thickness of the product. Because of this, it is best to have someone experienced with the specific application equipment apply the paint. The thicker a coating is applied, the more likely contaminants are to leach out of it. Manufacturers recommend a film thickness range for their products, which should not be exceeded.

In conclusion, when searching for a coating for a potable water application, buying one that is NSF/ANSI 61-approved does not mean that the product will be safe on its own for water contact. It is important to follow the manufacturer's instructions. Look for the certification body's mark on the product and check the certifying agency's online certification directory for any use restrictions that apply to the coating. Finally, if there are any questions related to the ratings, contact the manufacturer or certification body directly for clarification. *wqp*

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