



Architectural Color and Design: Why Can't I Get Bright Red Anymore?



Bright, dramatic colors have always been an influential part of the color palette in architectural design. A striking paint coating to the aluminum components of a structure can serve several purposes; it can match a building's exotic surroundings or contrast with its peaceful serene environment. The colors can match a school's color scheme or complement a company's logo.

In the architectural coatings industry it takes certain pigments to get bright and exotic colors such as reds, oranges and yellows. The most commonly known pigments to achieve these colors are the minerals lead and cadmium.

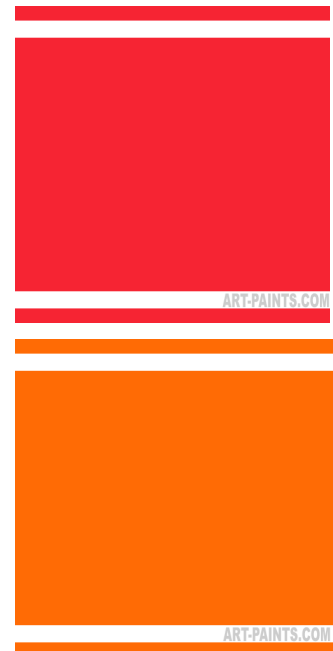
There are many minerals which are considered nutrients and are vital to proper functioning of the body. Equally, there are a number of minerals that are toxic to the human body and interfere with its functioning and undermine health. The group of most concern are known as heavy metals and include lead and cadmium.

Over the years, environmentally conscious manufacturers and applicators have refrained from using these pigments in their coating systems.

The raw materials used in the paint manufacturing process include pigments, solvents, and resins. The chemical composition of paint varies depending on the desired paint properties. Pigments provide the coating with color, opacity, and a degree of durability.

Valspar, and other paint manufacturers, now formulate all paint coatings with environmentally friendly organic pigments replacing lead and cadmium. These new pigments were derived from the automotive industry that has been using them successfully for years. The exterior performance is equal to that of the old cadmium-based pigment product. You will see no performance loss due to this new formulation.

More than ninety percent of the colors that were previously formulated with cadmium-based pigments can be made to match the same color using the less harmful pigments. The color difference in the remaining ten percent will generally be undetectable by the human eye –the exception may be with the bright red, yellow, and oranges.



Linetec works hard both internally and with the manufacturers to create the closest match possible without the use of lead or cadmium. In some cases, however, the matches will not have the same color characteristics as when lead or cadmium is used.

For the health and safety of our employees, our customers, and our environment it is Linetec's position not to apply paint coatings containing lead or cadmium. It is our desire that customers will choose to support our effort in eliminating the use of all heavy-metal paints.

Heavy Metal Toxicity - Lead



Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment and has no special taste or smell. About three-quarters of the nation's housing stock built before 1978 (64 million homes) contains some lead based paint. Chips and dust from this paint can create a health hazard. Recent studies indicate that almost one million children have blood-lead levels above safe limits. To protect children from exposure to lead in paint, dust, and soil, Congress passed the Lead-Based Paint Hazard

Reduction Act of 1992, also known as Title X. Lead is a major potential public health risk. With the exception of limited industrial settings such as to coat ship hulls, U.S. Occupational Safety & Health Administration (OSHA) has banned the use of lead pigments in paint.

Protection: OSHA limits the concentration of lead in workroom air to 50 µg (micrograms) per cubic meter for an eight-hour workday. The most effective way to protect workers is to minimize employee exposure through the use of engineering controls such as ventilation, encapsulation and isolation.

Exposure/Effects: Lead can affect almost every organ and system in your body. The most sensitive is the central nervous system, particularly in children. The effects are same whether it is breathed or swallowed.

Exposure to lead is more dangerous for young and unborn children. Harmful effects include premature births, decreased metal ability, learning difficulties and reduced growth.

In adults, lead may decrease reaction time, cause weakness in fingers, wrists, ankles, and possibly affect the memory. Lead may also cause anemia, a disorder of the blood.

Facts about lead include:

- Lead itself does not break down, but lead compounds are changed by sunlight, air and water
- When released to the air from industry or burning of fossil fuels or waste, it stays in air about 10 days
- Most of the lead in soil comes from particles falling out of the air
- City soils contain lead from landfills and leaded paint
- It does not move from soil to underground water or drinking water unless the water is acidic or "soft"

Heavy Metal Toxicity - Cadmium

Cadmium (Cd) is a soft, malleable, bluish white metal found in zinc ores, and to a much lesser extent, in the cadmium mineral greenockite. In 2011, US production of cadmium was estimated at 600 metric tons, down approximately 40% from the production levels 20 years ago (1992). Most of the cadmium produced today is obtained from zinc byproducts and recovered from spent nickel-cadmium batteries. First discovered in Germany in 1817, cadmium found early use as a pigment because of its ability to produce brilliant yellow, orange, and red colors.

Protection: OSHA limits the concentration of cadmium in workplace to five $\mu\text{g}/\text{cubic meter}$. The National Institute for Occupational Safety and Health (NIOSH) recommends that workers breathe as little cadmium as possible. Good hygiene practices recommend that engineering controls be used to reduce environmental concentrations to the permissible exposure level.

Exposure/Effects: Exposure to cadmium happens mostly in the workplace where cadmium products are made/used. Breathing high levels of cadmium severely damages the lungs and can cause death. Long term exposure to lower levels of cadmium in air, food, or water leads to a build up of cadmium in the kidneys and possible kidney disease. Other potential long-term effects are lung damage and fragile bones.

Facts about cadmium include:

- Cadmium enters air from mining, industry, and burning coal and household wastes
- Cadmium particles in air can travel long distances before falling to the ground or water
- It binds strongly with soil particles
- It doesn't break down in the environment, but can change forms
- Fish, plants and animals take up cadmium from the environment
- Cadmium stays in the body a very long time and can build up from many years of exposure to low levels