



Cradle to Cradle® Certification Program Restricted Chemicals

The following classes of chemicals are problematic to human and environmental health. Therefore there are restrictions to the amounts of these chemicals allowed in Cradle to Cradle Certified^{CM} products. (See the Material Health Criteria for more details on the limits allowed for each).

Heavy Metals

Toxic heavy metals can cause central nervous system damage, damage to blood composition, lungs, kidneys, liver, and other vital organs. Long-term exposure may result in slowly progressing physical, muscular, and neurological degenerative processes that mimic Alzheimer's disease, Parkinson's disease, muscular dystrophy, and multiple sclerosis. Allergies are not uncommon and repeated long-term contact with some metals or their compounds may even cause cancer.

Heavy metals can be used as catalysts in polymer production, as flame-retardants, in alloys and in pigments. Pigments used in paints and polymer resins are less likely to include heavy metals than colorants in glass and tile. Aluminum and diantimony trioxide are two flame-retardants found in fabric finishes. Antimony trioxide is the most common catalyst in production of the polymer polyethylene terephthalate (PET). PET catalyzed with titanium instead of antimony trioxide is preferred.

Organohalogens

Organohalogens are carbon-based molecules or polymers that are chemically bound to one or more halogen atoms (fluorine, chlorine, bromine, iodine). Organohalogens are problematic for a wide range of reasons. They can be carcinogens, teratogens, endocrine disruptors, reproductive toxins and neurotoxins. They are almost always persistent and bioaccumulative. The individual chemistry and toxicity of organohalogens varies widely, so each substance should be evaluated thoroughly.

Polyvinylchloride (PVC) is the most common of the highly problematic substances in consumer products. It can be found in wall coverings, window shades, and flooring, as well as subcomponents in products, in coatings, clips, edge-bindings, connectors and as insulation for wiring in electronics. Another common use for organohalogens is in pigments and dyes used in all kinds of fabrics, resins, inks, and paints.

Other organohalogens include Neoprene (chloroprene), Teflon® (PFTE) and other fluorinated finishes, antimicrobials such as Triclosan and brominated flame-retardants. These substances are found in paints, coatings, fabrics and finishes and are considered to be problematic ingredients.

Dioxins are a class of chlorinated organics with very high toxicity. They are often carcinogenic, endocrine disruptors, reproductive toxins and teratogens with many other adverse health effects. Dioxins are rarely found as direct ingredients in building products, but they are sometimes used in their production, such as with paper-bleaching and PVC production. Dioxin is formed by burning chlorine-based chemical compounds with hydrocarbons. This is further cause to rate chlorinated organics as problematic.

Volatile Organic Compounds

Volatile Organic Compounds (VOCs) are vapors that are emitted from organic substances. Organic solvents used in paints and coatings emit VOCs. VOCs are also attributed to adhesives. Many organic solvents and their vapors are toxic. Health conditions resulting from exposure to these chemicals include the following: eye, nose, and throat irritation; headaches; loss of coordination; nausea; and damage to liver, kidney, and central nervous system. Some organic solvents can cause cancer in animals; some are suspected or known to cause cancer in humans. Many VOCs react with light and other chemicals in the air to create smog and increase ground level-ozone. Some VOCs react with upper atmospheric ozone to destroy it. One example is formaldehyde, which is carcinogenic and emitted as a VOC from products that contain it. Formaldehyde can be found as a binder in plywood or particle board, wood and paper laminates and ceiling panels.

