

PVC PRINTING INKS AND PHTHALATES

Polyvinyl chloride (PVC) is a common and versatile plastic used in hard applications such as pipes and vinyl siding, soft applications such as hoses and children's toys, coatings on imitation leather, and even plastisol ink for printing on T-shirts. Additives change the properties of PVC for each of these different uses. Plasticizers, such as phthalates, make PVC soft and pliable – and even make it flow. Stabilizers, such as lead and organotin compounds, help PVC resist degradation from heat, light, chemicals and mechanical stress. Recent regulations to ensure the safety of plastic children's toys aim primarily at these additives and not at PVC itself. Additives, which may contribute up to 50% of the total weight of the plastic, can migrate to the surface where they either concentrate or leach out over time.

Leaching of Phthalates

Many types of phthalate esters (phthalates) may be used as plasticizers in PVC. Some are suspected to be endocrine disruptors that can alter hormone levels and affect reproductive development. Others are suspected carcinogens. Phthalates can migrate to the surface and leach out into the environment. This leaching effect, sometimes called off-gassing, decreases over time and increases with temperature or other stresses.

The European Union and, more recently, the United States, regulate six types of phthalate esters used in children's consumer products. Children have the highest potential health risk due to their developmental life stage, small body mass and high potential for oral exposure.

Printing Inks

Screen printing on garments commonly employs PVC inks called plastisol, a mixture of colored PVC particles with enough plasticizer to make it flow as a liquid. Although prints are heat-cured onto the garment, it is possible for phthalates to leach out onto the wearer's skin or into a child's mouth. The phthalates

themselves are colorless, but people who are allergic or have sensitive skin may develop a rash where there is direct contact with the printed area.

Patagonia requires screen-printing companies to use inks that are PVC-and phthalate-free. Most of these inks are based on colored acrylic polymer used in water without other solvents.