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Pigments Used in Shopping Bags May Contain Lead in Violation of State Laws
Overall Compliance Improving

Vibrant solid-colored shopping bags are at risk for containing high concentrations of lead in violation of state laws. The Toxics in Packaging Clearinghouse (“Clearinghouse”) screened 125 single-use shopping and mailing bags for the presence of lead, cadmium, mercury and hexavalent chromium in the inks used to print or color the bags. These toxic metals are regulated in packaging by nineteen U.S. states.

Only three bags failed the screening test for lead, however, each of the failing samples contained about 1 percent lead by weight of the bag. “This means that for every 100 pounds of these shopping bags, we’re introducing about 1 pound of lead into commerce,” according to Dr. Alex Stone of the State of Washington, Department of Ecology. “These bags ultimately end up in our incinerators, landfills, or recycling streams. Lead is considered a persistent, bio-accumulative toxin. It’s a metal and isn’t destroyed, but only accumulates.”

The shopping bags that contained lead were all vibrant solid-colored plastic bags -- two were bright yellow and one red. Only one of the bags was marked with the country of origin, and in that case it was manufactured in the U.S. “It was a surprise to find a packaging sample manufactured in the U.S. that violated our state laws,” said Kathleen Hennings of the Iowa Department of Natural Resources. “In the past we’ve typically only found lead and cadmium in packaging manufactured overseas.” States are working with these companies to address the issues identified.

Overall, states were pleased with the high level of compliance with state toxics in packaging laws. An earlier screening project by the Clearinghouse, released in 2007, showed almost 17 percent non-compliance for plastic shopping bags of a total of 60 samples screened. The Clearinghouse included some retail brand shopping bags that failed in the 2007 project in the

current screening. The results on these new bags indicated they were in compliance. The Clearinghouse was encouraged by these results, which may indicate manufacturers and distributors of plastic shopping and mailing bags are paying more attention to sourcing and testing for compliance with toxics in packaging laws.

The Clearinghouse routinely screens packaging for the presence of regulated metals using x-ray fluorescence (XRF) analysis. XRF analysis is a rapid and inexpensive screening tool for measuring the elemental composition of samples, including metals restricted by state packaging laws, including cadmium, lead, and mercury. For this study, packaging samples were screened using an Olympus Innov-X Systems DELTA handheld XRF instrument. Samples failing the XRF screening with >100 parts per million of a regulated metal were sent to a laboratory to confirm the XRF results.

Over the past several years, TPCH has demonstrated that manufacturers and distributors must be vigilant about their packaging materials. Lead and cadmium are sometimes added to pigments used in colorants that make single-use shopping bags colorful or to flexible PVC packaging as an inexpensive plasticizer and UV stabilizer. Although these substances may pose little direct risk to the average consumer handling the packaging, when the packaging material is disposed of in landfills or incinerators, these toxic metals can enter the environment and pose a risk to health and safety.

The report, [**XRF Screening of Packaging Components: Inks & Colorants**](#), is available for download on the [TPCH](#) website.

About the Toxics in Packaging Clearinghouse. The TPCH supports and helps coordinate the implementation of states' toxics in packaging laws. Nineteen U.S. states have toxics in packaging requirements. Nine states -- California, Connecticut, Iowa, Minnesota, New Hampshire, New Jersey, New York, Rhode Island, and Washington -- are members of the TPCH. The TPCH, which is administered by the Northeast Recycling Council, Inc. (NERC), serves as a central location for processing information requests from external constituencies and promoting compliance with the laws.