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Using an alternatives assessment framework to evaluate waterborne versus solventborne basecoats used in automotive refinishing

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Abstract

We evaluated two types of automotive basecoats used in automotive refinishing (i.e., in auto body shops): waterborne and solventborne. The primary tool we used for this evaluation was the Alternatives Assessment Guide (version 1.0) developed by the Interstate Chemicals Clearinghouse (IC2). The term "solventborne," as used in this article, refers to products that contain relatively high concentrations of volatile organic compounds (referred to as "high-volatile organic compound [VOC] basecoats" in the industry). These products are distinct from the "low-VOC" solventborne products used widely in California and elsewhere. From a health and environmental hazard perspective, our evaluation found that waterborne basecoats contained fewer hazardous ingredients and at lower concentrations than their solventborne counterparts. Automotive painters who spray-painted vehicles with waterborne products experienced significantly lower exposures to several harmful solvents. Waterborne products are readily available and offer advantages with regard to social impacts. Some of these advantages include lower worker and community exposure to VOCs, reduced VOC release and smog formation, and reduced potential for generation of and exposure to hazardous waste. Based on our assessment in auto body shops, we consider waterborne basecoats to be safer alternatives from both a human health and environmental perspective. Integr Environ Assess Manag 2021;00:1-13. Published 2021. This article is a U.S. Government work and is in the public domain in the USA.

Keywords: Alternatives assessment; Automotive refinishing; Safer alternative; Solventborne basecoats; Waterborne basecoats.

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