



Highlights of [GAO-10-875](#), a report to congressional committees

Why GAO Did This Study

Formaldehyde—one of the most widely produced chemicals in the world—is used in many products, including disinfectants, pressed-wood, and clothing and other textiles. Exposure to this chemical, which has been linked to adverse health effects for more than 30 years, typically occurs through inhalation and dermal (skin) contact. Formaldehyde can be used to enhance wrinkle resistance in some clothing and textiles, especially those made of cotton. The Consumer Product Safety Commission reviewed formaldehyde in clothing in the 1980s and determined that the levels found did not pose a public health concern. At that time, most clothing sold in the United States was made here—but the market has changed such that most U.S. clothing is now made in other countries. This market change has raised anew questions about the levels of formaldehyde in clothing.

In response to a mandate in the Consumer Product Safety Improvement Act of 2008, this report provides information on what is known about (1) the health risks of exposure to formaldehyde, particularly from clothing, and (2) the levels of formaldehyde in clothing sold in the United States. GAO analyzed government reviews and the medical literature, as well as studies on levels of formaldehyde in clothing, and had a sample of 180 textiles—primarily clothing—tested for formaldehyde by an accredited laboratory. While illustrative of formaldehyde levels that may be found in clothing, the test results from GAO's sample cannot be projected to all clothing sold in the United States. This report contains no recommendations.

[View GAO-10-875 or key components.](#)
For more information, contact John B. Stephenson at (202) 512-3841 or stephensonj@gao.gov.

FORMALDEHYDE IN TEXTILES

While Levels in Clothing Generally Appear to Be Low, Allergic Contact Dermatitis Is a Health Issue for Some People

What GAO Found

The potential health risks associated with formaldehyde vary, depending largely on the means of exposure (e.g., inhalation or dermal contact), the concentration of the formaldehyde, and the duration of exposure. Inhaled formaldehyde may cause such effects as nausea, exacerbation of asthma, and cellular changes that may lead to the development of tumors. In fact, comprehensive reviews by the Department of Health and Human Services, the Environmental Protection Agency, and the World Health Organization have found that chronic inhalation exposure to formaldehyde may cause cancer. However, the health risk of greatest concern associated with formaldehyde in clothing—*allergic* contact dermatitis—stems from dermal exposure. A form of eczema, allergic contact dermatitis affects the immune system and produces reactions characterized by rashes, blisters, and flaky, dry skin that can itch or burn. Another potential health effect from dermal exposure to formaldehyde—*irritant* contact dermatitis—is also a form of eczema and has similar symptoms; however, this condition does not affect the immune system. Avoiding clothing containing formaldehyde is typically effective at preventing allergic and irritant contact dermatitis and relieving symptoms, but doing so can be difficult as clothing labels do not identify items treated with or containing formaldehyde. Washing clothing before it is worn often reduces formaldehyde levels but is not always successful. In some cases, avoiding or relieving allergic contact dermatitis requires more drastic measures, such as taking medications with potentially serious side effects. Finally, consumers may also experience dermal exposure to formaldehyde by using some cosmetics and skin care products, such as shampoos and sunscreens that contain formaldehyde.

Comprehensive data on formaldehyde levels in clothing sold in the United States are not publicly available. While formaldehyde levels in clothing are not regulated in the United States, the apparel industry reports that 13 countries have laws or regulations that limit formaldehyde levels in clothing. Most of the 180 items GAO had tested had formaldehyde levels that were below the most stringent of these industry-identified regulatory limits. GAO's test results are similar to those of recent studies of formaldehyde levels in clothing by the European Union, New Zealand, and Australia—that is, most items were found to meet the most stringent limits. Moreover, government studies we reviewed showed a decline in the formaldehyde levels in clothing since the 1980s, and the levels reported in these studies are generally consistent with the decline in levels reported in the medical literature. This decline is associated with the development and use of low-formaldehyde technologies (resins) in manufacturing clothing, which has been encouraged by such factors as the identification of formaldehyde as a probable human carcinogen via inhalation; the promulgation of federal regulations protecting workers from inhalation exposure to formaldehyde; and limits on formaldehyde levels that some U.S. retailers have established for clothing they sell.