



## ISSUE BRIEF: INDOOR AIR QUALITY

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Manufactured homes are built in a controlled factory environment and designed to a performance-based building code that considers the entire building envelope to maximize indoor air quality, including energy efficiency, moisture and ventilation.

### **TALKING POINTS**

- Manufactured homes, are built to a strict residential building code regulated by the federal government. HUD is charged with establishing and enforcing appropriate standards for the construction, design, performance and installation of manufactured homes to assure their quality, durability and safety.
- The HUD Code was the first building code to consider the harmful effects of adhesives and binders found in all hardwood plywood products used in residential construction. These products, in addition to furniture and carpeting, may contain formaldehyde.
- Manufactured homes and site-built homes are constructed with materials that have emission standards for formaldehyde. New construction materials and techniques, such as whole-house ventilation, have been incorporated into manufactured home building to the point where formaldehyde concentrations have been significantly reduced.
- All manufactured homes have notices advising residents on the proper ventilation procedures to dilute formaldehyde gas buildups. Site-built homes do not follow this practice, even though they can contain the same formaldehyde levels.
- The vast majority of manufactured homes built today feature gypsum drywall materials which do not contain formaldehyde. In addition, a number of companies offer optional flooring materials, such as oriented strand-board or plywood, which have very low formaldehyde levels.
- The HUD Code has required mechanical ventilation in addition to natural ventilation since 1994. In contrast, the site-built codes have not required mechanical ventilation until very recently.

### **BACKGROUND**

In February 1985, the U.S. Department of Housing and Urban Development (HUD) established formaldehyde emission standards for the plywood and particleboard used in manufactured homes and the placement of "Important Health Notices" in homes, advising residents that proper ventilation was recommended to dilute indoor air contaminants. The site-built housing industry has not followed this practice, even though significant formaldehyde levels and other contaminants can be present in new site-built homes.

In 1994, HUD established improved whole-house ventilation standards for manufactured homes, which require the manufacturer to install ventilation features. In addition, Congress passed legislation in 2011, which becomes effective at the end of 2016, to regulate formaldehyde emissions in all composite wood products, including all site-built homes, furniture and recreational vehicles to further reduce formaldehyde exposures.

The problem with formaldehyde and indoor air quality came to light in the press during Hurricane Katrina when thousands of towable recreational vehicles (not manufactured homes) were found to have high levels of formaldehyde.

Since that time, at the urging of MHI, FEMA has required that all Temporary Housing Units used for disaster relief and recovery are built to the HUD Code with its rigorous formaldehyde emissions standards.

Updated: September 12, 2016

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