

Common Household Contaminants: The Hazards and the Laws

The National Center for Healthy Housing (NCHH) developed this summary to serve as a short guide for health and housing professionals on common household contaminants. It is not comprehensive. As a guide, NCHH provides only short descriptions intended as a reminder to professionals. Professionals need a solid understanding of the contaminants to make the best use of this guide. See references at

http://healthyhousingolutions.com/wp-content/uploads/2015/06/Essentials_Refs_Connections_BW_Jan20141.pdf

Table 1 Hazards Posed by Common Household Contaminants				
Contaminant (sorted by name)	Primary Health Impact	Common Sources in Home	Primary Routes of Exposure	“Keep Its” (listed by priority)
Asbestos	<ul style="list-style-type: none"> ● Lung cancer ● Asbestosis (scar tissue buildup in lung) ● Mesothelioma (cancer of the lining of chest and abdomen) 	<ul style="list-style-type: none"> ● Insulation / Vermiculite ● Floor tiles ● Sheet vinyl flooring ● Cement shingles or roofing ● Plaster and joint compound ● Gaskets 	<ul style="list-style-type: none"> ● Inhalation of fibers from deteriorated, damaged or disturbed material 	Maintained Contaminant-Free Dry Clean
Arsenic	<ul style="list-style-type: none"> ● Skin cancer 	<ul style="list-style-type: none"> ● Copper Chrome Arsenate (CCA) Treated lumber (produced before 2004) ● Private wells (in some locations) 	<ul style="list-style-type: none"> ● Ingestion of residue from wood or soil ● Splinters ● Drinking water 	Maintained Safe
Carbon Monoxide	<ul style="list-style-type: none"> ● Death ● Central nervous system damage 	<ul style="list-style-type: none"> ● Combustion appliances ● Attached garage 	<ul style="list-style-type: none"> ● Inhalation 	Ventilated Maintained Clean
Cockroaches	<ul style="list-style-type: none"> ● Asthma ● Allergies ● Stomach Illness ● Communicable disease 	<ul style="list-style-type: none"> ● Walls, cavities and other places to hide 	<ul style="list-style-type: none"> ● Inhalation ● Ingestion 	Pest-Free Clean Dry Maintained
Formaldehyde	<ul style="list-style-type: none"> ● Respiratory Irritation & Sensitization ● Nasal Cancer 	<ul style="list-style-type: none"> ● Glues ● Press wood products 	<ul style="list-style-type: none"> ● Inhalation 	Contaminant-Free Ventilated
Lead	<ul style="list-style-type: none"> ● Nervous system / brain damage ● Learning, behavioral Problems ● Cancer 	<ul style="list-style-type: none"> ● Deteriorated paint ● Lead in soil and dust ● Lead in water ● Some consumer products 	<ul style="list-style-type: none"> ● Ingestion ● Inhalation of dust from renovation, or disturbing lead-based paint. 	Maintained Clean Dry Contaminant-Free
Mercury	<ul style="list-style-type: none"> ● Nervous system / brain damage 	<ul style="list-style-type: none"> ● Florescent lamps ● Thermometers ● Switches 	<ul style="list-style-type: none"> ● Inhalation 	Maintained Ventilated Clean Contaminant-Free

Common Household Contaminants: The Hazards and the Laws

Table 1 Hazards Posed by Common Household Contaminants				
Contaminant (sorted by name)	Primary Health Impact	Common Sources in Home	Primary Routes of Exposure	“Keep Its” (listed by priority)
Mold	<ul style="list-style-type: none"> ● Asthma ● Hypersensitivity pneumonitis ● Coughing / Wheezing ● Upper respiratory tract symptoms 	<ul style="list-style-type: none"> ● Damp indoor environments ● Water damaged materials 	<ul style="list-style-type: none"> ● Inhalation ● Ingestion 	Dry Maintained Clean Ventilated
Nitrogen Oxides	<ul style="list-style-type: none"> ● Asthma Exacerbation 	<ul style="list-style-type: none"> ● Combustion appliances 	<ul style="list-style-type: none"> ● Inhalation 	Ventilated Maintained
Pesticides	<ul style="list-style-type: none"> ● Depends on pesticide used, often nervous system 	<ul style="list-style-type: none"> ● Current use ● Residue from past use 	<ul style="list-style-type: none"> ● Inhalation ● Ingestion ● Dermal 	Pest-Free Contaminant-Free Maintained Ventilated
Radon	<ul style="list-style-type: none"> ● Lung cancer 	<ul style="list-style-type: none"> ● Soil, clay or rock from around and underneath foundation 	<ul style="list-style-type: none"> ● Inhalation 	Ventilated Contaminant-Free Maintained Dry
Rodents	<ul style="list-style-type: none"> ● Asthma (mice) ● Infectious disease ● Bites 	<ul style="list-style-type: none"> ● Walls, cavities, crawlspaces and other places to hide 	<ul style="list-style-type: none"> ● Inhalation ● Ingestion ● Bites 	Pest-Free Maintained Dry Clean
Sewer Gas	<ul style="list-style-type: none"> ● Fire & explosion ● Central nervous system damage ● Respiratory system damage 	<ul style="list-style-type: none"> ● Broken sewers ● Empty drain traps 	<ul style="list-style-type: none"> ● Inhalation 	Maintained Ventilated
Volatile Organics (VOCs)	<ul style="list-style-type: none"> ● Depends on chemical, often nervous system damage ● Can be poisoning hazard 	<ul style="list-style-type: none"> ● Air fresheners ● Glues & building materials ● Sprays & coatings ● Household cleaners 	<ul style="list-style-type: none"> ● Inhalation ● Ingestion 	Contaminant-Free Safe Ventilated

Notes:

- Only some common household contaminants with significant potential hazards are listed.
- Contaminants are sorted alphabetically.
- Primary health impact is based on hazard posed by contaminant in common household settings.
- “Keep Its” refers to the Seven Principles of Healthy Housing.
- “Keep Its” are listed by their importance to addressing hazard.

Common Household Contaminants: The Hazards and the Laws

Table 2 Federal/State Requirements for Homes Regarding Common Household Contaminants					
Contaminant	Sale or Use	In-Home Hazard Level	Disclosure to Resident	Renovation Work Practices	State Requirements
Asbestos	EPA banned sale in textured paint, patching / joint compounds, and thermal systems insulation in 1977. <i>Note: EPA banned sale in most products reversed by court in 1991.</i>	EPA - Friable asbestos containing material confirmed by lab to be asbestos. <i>Note: Testing not required.</i>	<i>None</i>	<ul style="list-style-type: none"> • EPA requires work practices if renovation of housing with more than four units per building. • EPA requires work practices if any demolition. • OSHA requires work practices. 	<ul style="list-style-type: none"> • Most states adopt EPA work practices & professional licensing standards. • Some states require disclosure.
Arsenic	EPA banned CCA lumber production in 2004.	<i>None.</i>	<i>None</i>	<i>None</i>	Some states set standards in soil
Carbon Monoxide	<i>Not applicable</i>	CPSC – Alarm sounds at life-threatening conditions. <i>Note: Alarm not required.</i>	<i>None</i>	<i>None</i>	Some states require alarms. IRC requires alarm when getting permit.
Cockroaches	<i>Not applicable</i>	HUD HQS - Free of infestation	<i>None</i>	<i>None</i>	IPMC and some states prohibit infestation and set cleanup stds.
Formaldehyde	HUD sets stds on wood products in manufactured housing.	<i>None</i>	HUD requires warning in manufactured housing.	OSHA has exposure limits and requires controls and work practices.	California sets stds on wood products in use except mfg hsg.
Lead	<p>CPSC</p> <ul style="list-style-type: none"> • Banned sale or application in new paint after 1977. • Strictly limited lead in children's products after 2/10/2009 	<p>EPA</p> <ul style="list-style-type: none"> • Deteriorated lead-based paint. • High levels of lead in dust or soil. See Table 3 • No imminent & substantial endangerment. <p><i>Note: HUD requires testing in federally-assisted housing. CPSC requires testing</i></p>	<p>EPA/HUD required for:</p> <ul style="list-style-type: none"> • Housing sale or lease. • Contractors must give pre-renovation notice. 	<ul style="list-style-type: none"> • EPA requires: <ul style="list-style-type: none"> ○ Pre-renovation notification ○ Work practices (effective 4/22/10) • HUD requires work practices on subsidized property • OSHA requires work practices. 	<ul style="list-style-type: none"> • IPMC & some states prohibit deteriorated paint. • Most state adopt EPA work practices and professional licensing standards. • Some states require more.

Common Household Contaminants: The Hazards and the Laws

Table 2 Federal/State Requirements for Homes Regarding Common Household Contaminants					
Contaminant	Sale or Use	In-Home Hazard Level	Disclosure to Resident	Renovation Work Practices	State Requirements
		<i>after 2/10/10.</i>			
Mercury	CPSC banned sale in interior latex paint.	<i>None</i>	<i>None</i>	<i>None</i>	Some states ban mercury in some products.
Mold	<i>Not applicable</i>	<i>None</i>	<i>None</i>	<i>None</i>	Some states require cleanup and licensing.
Nitrogen Oxides	<i>Not applicable</i>	<i>None</i>	<i>None</i>	<i>None</i>	<i>None</i>
Pesticides	EPA bans sale or use of unregistered pesticides.	EPA - Depends on pesticide.	<i>None</i>	All required by EPA to follow label. Most states license contractors using pesticides.	Many states require licensing of professionals. Some states restrict use.
Radon	<i>Not applicable</i>	Recommended action level of 4 picocuries per liter of air	<i>None</i>	<i>None</i>	Some states require testing, licensing and remediation.
Rodents	<i>Not applicable</i>	HUD HQS - Free of infestation	<i>None</i>	<i>None</i>	IPMC and some states prohibit infestation and set cleanup stds.
Sewer Gas	<i>Not applicable</i>	<i>None</i>	<i>None</i>	<i>None</i>	IPMC and some states require drain traps to be have water.
Volatile Organic (VOCs)	<i>None</i>	HUD HQS - Free of pollutants in air at levels that threaten health	<i>None</i>	<i>None</i>	<i>Unknown</i>

Notes:

- CPSC = U.S. Consumer Product Safety Commission
- EPA = U.S. Environmental Protection Agency
- HQS = HUD's Housing Quality Standards for property covered by Housing Choice Vouchers (Section 8 Vouchers)
- HUD = U.S. Department of Housing and Urban Development
- IPMC = International Property Maintenance Code
- IRC = International Residential Code.
- OSHA = U.S. Occupational Safety and Health Administration

Common Household Contaminants: The Hazards and the Laws

Table 3			
Key Federal Work Practice Requirement for Asbestos and Lead-Based Paint			
Lead-Based Paint Renovation Work Practices			
Agency Rule	Professional Licensing	Trigger for Requirements	Clearance Testing
<p>EPA LPB Activities – 40 CFR 745 Subpart L - 8/29/1996</p>	<ul style="list-style-type: none"> ● Dust Sampling Technician – Conducts clearance. ● Inspector – Determines if paint is lead-based paint. Conducts clearance. ● Risk Assessor – Determines if paint is lead-based paint. Conducts clearance. Evaluates hazards and recommends corrections. ● Abatement Contractor, Supervisor, and Worker – Conduct abatement. 	<p>Abatement – permanent elimination of lead-based paint hazards but not renovation. Pre-renovation notice to EPA (or authorized state).</p>	<p>Independent risk assessor or inspector must confirm levels less than:</p> <ul style="list-style-type: none"> ● 40 µg/ft² on floors; ● 250 µg/ft² on window sills; ● 400 µg/ft² in window trough (cleanup if window disturbed); ● 400 ppm in soil in play area; and ● 1200 ppm in soil in other areas
<p>HUD Lead-Safe Housing – 24 CFR Part 35 - 9/6/1996</p>	<p>None unless abatement required but HUD requires training for:</p> <ul style="list-style-type: none"> ● Supervisor and worker completes HUD-approved lead-safe work practices course; or ● Supervisor completes Abatement Supervisor course and trains workers. 	<p>Federal subsidized property disturbing more than:</p> <ul style="list-style-type: none"> ● 2 ft² per interior room; ● 20 ft² in exterior; or ● 10% of component; ● of paint in pre-1978 housing. 	<ul style="list-style-type: none"> ● Independent risk assessor, inspector, or dust sampling technician must confirm levels less than: ● 40 µg/ft² on floors; ● 250 µg/ft² on window sills; and ● 400 µg/ft² in window trough (cleanup if window disturbed)
<p>EPA Renovation, Repair & Painting – 40 CFR 745.80 to 745.91 - 4/22/2010</p>	<ul style="list-style-type: none"> ● Certified Renovation Firm with Certified Renovator 	<p>Renovation – Disturbing more than:</p> <ul style="list-style-type: none"> ● 6 ft² per interior room, ● 20 ft² in exterior; or ● Window replacement or paint demolition. ● of paint in pre-1978 housing over 30 days. 	<ul style="list-style-type: none"> ● Certified renovation conducting post-cleaning verification by comparing wipes to card. ● Option for independent clearance testing per HUD rule.

Common Household Contaminants: The Hazards and the Laws

Table 3 Key Federal Work Practice Requirement for Asbestos and Lead-Based Paint			
Asbestos Renovation Work Practices			
EPA NESHAP – 40 CFR 61.145 - 1990	<ul style="list-style-type: none"> ● Inspector – Determines if material contains asbestos. ● Management Planner – Determines if material contains asbestos. Evaluates hazards and recommends corrections. ● Project Designed – Designs renovation to comply with requirements. ● Abatement Contractor, Supervisor, and Worker – Conduct abatement. 	Disturbing more than: <ul style="list-style-type: none"> ● 260 ft on pipes; ● 160 ft² on other components; or ● 35 ft³ removed. ● of friable asbestos-containing material in calendar year. Pre-renovation notice to EPA (or authorized state). 	Zero visible emissions to the outside air from transport or disposal of asbestos waste.

Notes:

- *CFR = Code of Federal Regulations*
- *EPA = U.S. Environmental Protection Agency*
- *ft² = Square feet*
- *HUD = U.S. Department of Housing and Urban Development*
- *LBP = Lead-Based Paint*
- *NESHAP = National Emission Standard for Hazardous Air Pollutants*
- *µg/ft² = micrograms of lead per square foot of horizontal surface.*