

# Suggested Action Levels for Indoor Mercury Vapors in Homes



**General Exposure Assessment Considerations:** The primary route of entry for metallic mercury is by inhalation; ingestion and skin absorption of this form of mercury is usually not biologically significant. Sensitive populations to mercury exposure are those with developing central nervous systems, including young children and the fetuses of women who are pregnant. Other individuals of potential concern are those with pre-existing kidney conditions, usually at exposures to much higher concentrations than the first group. The specific exposure of these groups in any given situation should be considered when assessing the need for any given response action. Specific concerns are mentioned in the tables below. If there is any doubt, responders should consult with state or local public health officials before deciding on a course of action. Responders may also contact ATSDR at 404-639-0615, 24 hours a day.

**Exposure Assumptions for Different Settings:** For the purposes of this document, the residentially exposed population includes infants, small children, and pregnant women presumed to have inhaled mercury for a period up to 24 hours per day, 7 days per week potentially for months or even years. Occupational or commercial settings include those individuals that are primarily healthy adults exposed up to 8-10 hours per day, 40 hours per week, with transient exposures by sensitive populations (e.g., a retail establishment or schools). The concentrations provided as suggested action levels are for comparison to the environmental data collected in affected residences and workplaces.

**Background:** An *action level* is an indoor air concentration of mercury vapor, which should prompt consideration of the need to implement a recommended response by public health and environmental officials. The various suggested action levels provided in this document are intended as recommendations, not as regulatory values or cleanup values, although some may correspond to present or future values adopted by regulatory authorities. The suggested action levels presented in this document recognize that an individual must be exposed to a sufficient concentration over some specific period of time in order for mercury vapor to cause adverse health effects. The suggested action levels also recognize that while individual susceptibility may vary, developing fetuses and young children under six years old are generally at higher risk than others of incurring adverse health effects from exposure to mercury vapor. If the indoor air concentration corresponding to any suggested action level is exceeded, then a potential health risk may be present, and responders should evaluate the exposures at that location and consider implementing appropriate protective measures to reduce or eliminate the risk.

The suggested action levels presented here are based on data available in ATSDR's Toxicological Profile for Mercury (1999) or in the Hazardous Substance Databank of the Toxicology Data Network at the National Library of Medicine. ATSDR has also made use of additional data collected by the US Environmental Protection Agency (US EPA) and of specific experiences at other sites. Other factors considered in the development include available information on normal background levels and analytical detection limits of various techniques for evaluating airborne contamination. Any information specific to the exposures at any given location as described below should also be considered before implementing a response action.

These suggested action levels are extrapolated from health guidance values (HGVs) independently developed by two federal agencies, ATSDR and EPA. These HGVs are based on both animal studies and human epidemiology studies that detail the health effects of inhalation of mercury-contaminated air. ATSDR has developed a chronic Minimal Risk Level (MRL) of 0.2 ug/m<sup>3</sup> that is based on a 1983 study of workers exposed to an average Lowest Observed Adverse Effect Level (LOAEL) of 26 ug/m<sup>3</sup> over an average of 15 years. This workplace average exposure was adjusted from a 40 hour per week exposure to a 168 hour per week exposure (i.e., 24 hours/day, 7 days/week) and then divided by an uncertainty factor of 30 to account for the use of the LOAEL and the different sensitivities of individuals. In addition, EPA has used the same study to develop a Reference Concentration (RfC) of 0.3 ug/m<sup>3</sup>, using different assumptions and uncertainty factors. ATSDR considers the RfC and the Chronic MRL to be the same value for all practical purposes. A MRL, then, is defined as an estimate of the daily exposure level to a hazardous substance (in this case, metallic mercury) that is likely to be without appreciable risk of adverse, non-cancer health effects (metallic mercury is not considered to be a carcinogenic substance) over a specific exposure route and duration of exposure. For further information, see Section 2.5, Chapter 7, and Appendix A of the ATSDR Tox Profile and the EPA's Integrated Risk Information System (IRIS) on the Internet at [www.epa.gov/iriswebp/iris/index.html](http://www.epa.gov/iriswebp/iris/index.html)

### Suggested Action Levels for Mercury (CAS # 7439-97-6)

Indoor Air Concentration (ug/m <sup>3</sup> )	Use of the Action Level	Method of Analysis *	Reference
<1.0	Level acceptable for occupancy of any structure after a spill (also called the residential occupancy level)	NIOSH 6009 or Real-time air monitoring with Lumex or equivalent	ATSDR HGVs 1999. EPA/IRIS
10	Isolate residents from the exposure	Real-time air monitoring instrument (i.e., Jerome™ or Lumex meter equivalent)	ATSDR, 1999.
10	Acceptable level in a modified test procedure to allow personal effects to remain in the owner's possession	Real-time air monitoring instrument (i.e., Jerome™ or Lumex meter equivalent)	
3.0	Re-occupancy after a spill of an occupational or commercial setting where mercury is not usually handled.	NIOSH 6009 or equivalent	ATSDR HGVs 1999. EPA/IRIS
25	Occupational settings where mercury is handled. ♂	Real-time air monitoring instrument (i.e., Jerome™ or Lumex meter equivalent)	HSDB, 1999
25	Response Worker Protective Equipment Upgrade. ♂	Real-time air monitoring instrument (i.e., Jerome™ or Lumex meter equivalent)	29 CFR 1910.120; 40 CFR 311; NIOSH, 1987
10,000	IDLH. Response Workers Protective Equipment upgrade.	Real-time air monitoring instrument (i.e., Jerome™ or Lumex meter equivalent)	29 CFR 1910.120; 40 CFR 311; NIOSH 1987

\* Environmental analysis should be in accordance with the requirements specified by environmental authorities. When real-time air monitoring instruments are specified in this table, laboratory analysis may be substituted at the discretion of the risk managers involved in the event. Operation of real-time instruments should be in accordance with manufacturer's instructions.

♂ Women workers in these settings who are pregnant or attempting to become pregnant should consult their physicians regarding their mercury exposure.