

IMERC Fact Sheet

Mercury Use in Thermostats

Last Update: July 2008

“Mercury Use in Thermostats” summarizes the use of mercury in thermostats used in residences, businesses, and industrial settings, including thermostats sold as stand-alone units and as components within heating and cooling equipment. This Fact Sheet covers all the types of thermostats that contain mercury in the individual devices; the total amount of mercury in all of the devices that were sold as new in the U.S. in 2001 and 2004; companies that have phased-out the products’ manufacture and sale; and non-mercury alternative devices.

The information in this Fact Sheet is based on data submitted to the state members of the Interstate Mercury Education and Reduction Clearinghouse (IMERC)¹ including Connecticut, Louisiana, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The data is available online through the IMERC Mercury-Added Products Database.²

A number of important caveats must be considered when reviewing the data summarized in this Fact Sheet:

- This Fact Sheet does not include mercury thermostats used in cooking ranges; those thermostats are covered in the fact sheet entitled, *Mercury Use in Gas & Electric Cooking Ranges and Other Cooking Equipment*.³
- The information may not represent the entire universe of mercury-containing thermostats sold in the U.S. The IMERC-member states continuously receive new information from mercury-added product manufacturers, and the data presented in this Fact Sheet may underestimate the total amount of mercury sold in this product category.
- The information summarizes mercury use in thermostats sold nationwide since 2001. It does not include mercury thermostats sold prior to January 1, 2001 or exported outside of the U.S.
- Reported data includes only mercury that is used in the product, and does not include mercury emitted during mining, manufacturing, or other points in the products’ life cycle.

¹ IMERC: <http://www.newmoa.org/prevention/mercury/imerc/about.cfm>

² Mercury-Added Products Database:
<http://www.newmoa.org/prevention/mercury/imerc/notification/index.cfm>

³ Mercury Use in Gas and & Electric Cooking Ranges and Other Cooking Equipment Fact Sheet:
http://www.newmoa.org/prevention/mercury/imerc/FactSheets/factsheet_ranges.cfm

Mercury Components in Thermostats

Mercury thermostats use mercury switches to sense and control room temperature through communication with heating, ventilating, and air conditioning (HVAC) equipment.

Mercury thermostats contain bimetal coils that contract and expand with room temperature. When the coil contracts or expands, it activates the mercury switch, which opens or closes a circuit to make the furnace, heat pump, or air conditioner turn on or off. A mercury thermostat may contain one or more switches, depending on how many heating and cooling systems it activates.



Mercury Thermostat
Source: NEWMOA



Mercury Switch inside Thermostat
Source: Wikipedia



Mercury Thermostat
Source: NEWMOA

According to the Thermostat Recycling Corporation (TRC), mercury thermostats contain an average of 1.4 mercury switches (i.e., components), with a minimum of 2.8 grams of elemental mercury per switch. Therefore, the total amount of mercury used in a thermostat is approximately four grams.

Table 1 represents the amount of mercury in the switches contained in mercury thermostats reported by companies to the IMERC member-states. Manufacturers, importers and distributors of mercury-added products may report the amount of mercury used as an exact number or as a range.

Table 1: Amount of Mercury in Thermostats		
Mercury-added Component	Amount of Mercury in Individual Component (milligrams)	Number of Components/Switches
Switch	275	1
	> 1,000	1
	2,200 – 3,000	1-6

Mercury Use in Thermostats

Table 2 presents the total amount of mercury contained in mercury thermostats sold in the U.S. in years 2001 and 2004. This total includes thermostats used in residences, businesses, and industrial settings, including thermostats sold as stand-alone units and as components within heating and cooling equipment. More detailed information can be found in the report, *Trends in Mercury Use in Products: Summary of the IMERC Mercury-added Products Database*, June 2008.⁴

Table 2: Total Mercury Sold in Thermostats in the US (pounds)		
Product	2001 Total Mercury	2004 Total Mercury
Thermostats	30,971 (15.5 tons)	29,943 (15 tons)

Note: 1 gram = 0.002205 pounds.

As shown in Table 2, the total amount of mercury in thermostats sold in the U.S. during calendar years 2001 and 2004 was 15.5 tons and 15 tons, respectively. This represents a decrease of 0.5 tons, or approximately 3.5 percent over the three year period.

Since 2001, many states have passed legislation restricting the sale of mercury-added thermostats. As more state laws go into effect, mercury use in this product category will likely continue to decline.

Phase-Outs & Product Bans on the Sale of Mercury Thermostats

The following IMERC-member states currently have restrictions on the sale and/or distribution of mercury-containing thermostats: California, Connecticut, Illinois, Louisiana, Maine, Massachusetts, Minnesota, New Hampshire, Rhode Island, Vermont, and Washington. Additional states that restrict the sale of mercury thermostats include: Iowa, Michigan, Ohio, and Oregon.⁵ In response to these mercury product bans and phase-outs, many companies have ceased manufacturing mercury thermostats and/or stopped selling these products in these states.

The following is a list of companies and thermostat products that have reportedly been eliminated from the U.S. market since 2001:

⁴ Trends in Mercury Use in Products: Summary of the IMERC Mercury-Added Products Database: <http://www.newmoa.org/prevention/mercury/imerc/pubs/reports.cfm>

⁵ State Mercury-Added Product Ban Guidance: <http://www.newmoa.org/prevention/mercury/imerc/productban.cfm>
State Mercury-Added Product Phase-Out Guidance: <http://www.newmoa.org/prevention/mercury/imerc/phaseoutinfo.cfm>

Marvair reported to IMERC-member states that they discontinued their line of air conditioning units with mercury thermostats in December 2003.

Coachmen Recreational Vehicles reported to IMERC-member states that they phased-out mercury thermostats in their recreational vehicles in April 2004.

Sunline reported to IMERC-member states that they have not had any mercury-added products, including mercury thermostats, in their recreational vehicles since July 2004.

PSG Controls, Inc. reported to IMERC-member states in 2008 that they do not sell mercury thermostats in any of the IMERC states, as of their respective product ban dates. They do, however, continue to sell mercury thermostats to states without such bans.

Non-Mercury Alternatives

There are non-mercury alternatives that may be suitable for replacing mercury thermostats. These include electromechanical (i.e., air-controlled, reed switch, vapor-filled diaphragm, snap-switch) and electronic programmable thermostats (i.e., digital). Many factors should be considered when switching to a non-mercury thermostat, including the relative costs, availability, and product effectiveness.

Many of the non-mercury alternatives are readily available from wholesale and retail heating and plumbing supply stores at a generally comparable price as mercury thermostats. Programmable thermostats are more expensive than traditional mercury thermostats, but can save energy and money, by enabling users to adjust the temperature or turn off the heat or air conditioning automatically depending on the time of day.

Collection and Recycling Programs for Mercury Thermostats

The Thermostat Recycling Corporation's (TRC) thermostat collection program is an industry-sponsored private corporation, originally established by thermostat manufacturers Honeywell, White-Rodgers, and General Electric. TRC facilitates the collection of all brands of used, wall-mounted mercury-switch thermostats so that the mercury can be separated and recycled. Collection takes place through Heating, Ventilation, and Air Conditioning (HVAC) wholesale outlets, HVAC contractors, and more recently through local household hazardous waste facilities throughout the U.S. Participation is voluntary, and the companies and agencies collecting the thermostats pay a one-time fee of \$25.00 to obtain a collection bin to store and ultimately transport the thermostats for recycling. The elemental mercury from the thermostats collected through this program is reclaimed.

In addition to the TRC program, some states, including Iowa, Maine, New Hampshire, Oregon, and Vermont have legislation requiring thermostat manufacturers to establish collection programs for recycling out-of-service mercury thermostats. Maine and

Vermont also require these manufacturers to pay a financial incentive to persons recycling mercury thermostats. This is a fairly new initiative in both states, but preliminary collection results show that the incentive is playing a key role in increasing mercury thermostat recycling rates.

Many other states, including California, Illinois, Maine, Massachusetts, Minnesota, New Hampshire, New York, Rhode Island, and Vermont have laws restricting or fully prohibiting the disposal of mercury-added thermostats in household trash. As a result, these states are actively working to improve mercury thermostat collection and recycling – either by promoting the TRC’s mercury thermostat collection and recycling program; or through other local, state, or regional mercury thermostat collection programs.

For more information on the state programs and legislation pertaining to the collection of mercury thermostats, go to: <http://www.newmoa.org/publications/index.cfm#mercury>.