

The Department of Environmental Protection (DEP) facts regarding the Prospect, Maine Compact Fluorescent Lamp breakage.

Upon receiving a call from a citizen in Prospect, Maine who was concerned about mercury exposure from the accidental breakage of a compact fluorescent lamp (CFL), a Department spill response staff person went to the individual's house on March 14, 2007 to evaluate the levels of mercury present. The Department has extensive experience with other types of mercury spills, but did not have experience with the mercury levels that might occur from a CFL breaking on carpet. In addition to evaluating the levels in the home, the Department planned to use this breakage event as a means of gathering information to better respond to future events.

A single CFL fell onto carpet in the homeowner's child's bedroom two days earlier. The CFL had been dropped when it was being cleaned. It fell and hit a metal vent between the second floor and first floor. The carpet, squares of multi colored carpet, was planned for removal as part of an intended renovation. Prior to the DEP staff person's arrival, the visible pieces of the bulb had already been cleaned up. All measured air levels mentioned below reflect levels two days after the initial breakage and not necessarily the levels at the time of breakage.

The Department staff person arrived with a Lumex instrument, which is designed to take instantaneous mercury vapor readings. The Department responders work under a guidance value of 300 nanograms per cubic meter (ng/m^3)¹ for mercury. If readings are $300 \text{ ng}/\text{m}^3$ or less, the area is considered to not require any additional actions and no additional clean up advice is given. In situations with values over $300 \text{ ng}/\text{m}^3$, the Department responder consults with the State Toxicologist for a more refined evaluation. This consultation considers whether additional actions are warranted to clean up the spill or whether precautionary actions need to be taken to protect the homeowner. In addition, if individuals are particularly concerned about mercury related hazards or any of the mercury readings, they are also referred to the State Toxicologist.

When a Department responder goes to the site of a spill, there are typically two types of instrument measurements that they would take. The first is an evaluation of the source of the spill. This is to identify any hot spots or areas of concern, to determine the extent of the spill, and whether it has been tracked extensively throughout the home. This helps determine the extent of the effort to clean up the spill, if any. This type of measurement is generally at the floor or point of impact. The second type of measurement taken are those readings that are more useful for homeowner exposure and are typically in the "breathing zone", at an intermediate height for children and a higher height more appropriate for adults.

The Lumex values as recorded by the Department responder at the Prospect home were:

Sample Location	Mercury Concentration² (ng/m^3)	%R³
Base level in yard	2	%R less than 10
Bedroom door at breathing zone (three feet)	49	%R 20
Carpet in bedroom	34	%R 4
Air in bedroom at breathing zone (three feet)	31	%R 11
Bag with clean up debris	556	%R 16

¹ The Maine ambient air guideline for mercury is $300 \text{ ng}/\text{m}^3$.

² Value is an average of the average of three separate results taken over a 30 second time frame.

³ %R is the relative deviation of three measured concentrations. The more variability, the higher is the %R.

Underneath the carpet square where the break happened	36	%R 14
Over the carpet where bulb broke	1,939	%R 12
Toys	93	%R less than 25%
Carpet on first floor under vent to downstairs where lamp broke	18	%R 6
Exist baseline	15	%R 6

Since the homeowner was very concerned about mercury exposures and the carpet (planned to be removed for renovations) had a value directly on the carpet of over 300 ng/m³, the homeowner was referred to our State Toxicologist for further guidance. In addition, the homeowner questioned the Department staff with how to deal with the carpet. The homeowner expressed particular nervousness about exposures to mercury even in low numbers. Based on that concern, the responder explained two ways to minimize exposures to mercury: one way was to wear respiratory protection and another way was to hire a clean-up contractor. Since the homeowner did not have any respirator protection, the responder referred her to a commercial clean-up contractor. The responder further suggested that the homeowner talk with their homeowner's insurance company to see if her policy would cover the cost of a professional clean-up contractor.

The homeowner did follow up with the State Toxicologist at the responder's suggestion. The State Toxicologist talked with the responder about the values along with a discussion of the values over 300 ng/m³. The only value within the room that was over 300 ng/m³ was directly at the bulb breakage location on the carpet. Moving the Lumex instrument six to eight inches in either direction or up toward the ceiling dropped the value significantly. To visualize the area of high readings, it could be covered by a dinner plate. All other values in the room, including in the first floor room where some residue might have fallen through the vent, were well below the 300 ng/m³ action level. Based upon this information, the State Toxicologist assured the homeowner that the potential mercury exposure would be very low and likely of negligible health concern.

The homeowner called a clean-up contractor and got a quick quote for a mercury spill clean up. This price has been quoted in newspapers as being \$2,000. Newspapers have also quoted the homeowner as stating that her insurance policy would not cover clean up costs.

The Department tried to reach the homeowner to determine the current levels of mercury on the one spot with readings over 300 ng/m³. The homeowner called the Department on May 15, 2007 and agreed to have the Department come to her house on Friday (May 18, 2007) to obtain measurements and potentially remove the carpet piece in question. Upon arrival on Friday, the Department responder found no measurements over 300 ng/m³, including at the point of impact. However, the carpet piece was removed by the responder at the request of the homeowner.

The Department notes that CFLs do contain a small amount of mercury, they do need to be properly cleaned up when broken, and they need to be taken to a recycling facility for fluorescent bulbs when being disposed of. The Department has a list of local recycling locations as well as directions on how to clean up a fluorescent light bulb breakage on its website www.MaineDEP.com. In addition, the Department is working with the Maine Public Utilities Commission to establish additional CFL collection locations at local hardware stores.

The Department has designed a controlled CFL breakage study which will begin the week of May 21st to test various clean-up options and techniques available to the homeowner. This experiment will provide more information to the Department to give future guidance based upon a study geared to the issues associated with CFL use in the home.

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