



# Environmental Health Information

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## Drum-top fluorescent bulb crushers: Advice to Schools

November 2007

*This information sheet is based on a November 9, 2007 e-mail from the Minnesota Department of Education to public school Health and Safety Coordinators and members of the Minnesota Association of School Maintenance Supervisors.*

### **Drum-top fluorescent bulb crushers should not be used in schools**

*Drum-top crushers are used to crush fluorescent bulbs prior to recycling.*

*These drum-top crushers are being marketed to schools in Minnesota.*

*Use of drum-top crushers is **illegal** in Minnesota.*

*Dangerous levels of mercury vapor in air can be generated during operation of a drum-top Crusher.*

*Recycling whole bulbs is likely to be cheaper than owning and operating a drum-top crusher – even without including the potential costs of exposure and building contamination.*

This letter is intended to inform you about the health risks that could result from the use of drum-top crushers (DTCs), and to inform you that DTCs remain illegal in Minnesota.

#### **Demonstration of DTC use in Minnesota**

The Minnesota Pollution Control Agency (MPCA) and the Minnesota Department of Health (MDH) attended a demonstration of a DTC at a large business in 2002. A realtime mercury vapor analyzer was used to monitor mercury exposures during the demonstration. As a result of a review of the data from the demonstration and following consultation with hazardous waste coordinators from Hennepin and Ramsey Counties and MDH staff, MPCA banned the use of DTCs in Minnesota. This was reported in the MPCA magazine, *Minnesota Environment*, Summer 2002 (2:4). In 2003, MDH wrote a public health report that reviewed the demonstration and data (<http://www.health.state.mn.us/divs/eh/hazardous/topics/drumtop.pdf>).

#### **US Environmental Protection Agency Study**

In 2005, the US EPA conducted a study using four DTCs from different manufacturers. Data from this study were similar to the MPCA/MDH data from 2002. These data showed that the mercury vapor concentration in the vicinity of an operating DTC can be well above the OSHA Permissible Exposure Limit (PEL) without warning. The only way to assure that the PEL is not being exceeded is to monitor the output of a DTC with a mercury vapor analyzer.



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In addition to exposing the person operating the DTC, people in the same or nearby rooms could be exposed to mercury vapors. The PEL is about 4 times the level that has been shown to cause adverse health effects in healthy adults with longterm workplace exposures. Safe mercury vapor concentrations for children have not been identified, but children can be more sensitive to mercury than adults.

Even a perfectly operating DTC emits mercury vapor at concentrations that are typically 10 to 100 times higher than public health exposure criteria. There is great risk of unexpectedly exposing people to unsafe levels of mercury vapor in a building where crushing occurs. In addition, crushing can cause longterm contamination of a building, making cleanup difficult and expensive.

### **A study of recycling alternatives**

Alan Lucas (Mgr, Environmental Protection, U of Texas, Houston) coauthored a paper on DTCs (JEH, 2006) that confirmed MPCA, MDH and EPA's findings. Under current market conditions, he found that it is cheaper to have fluorescent bulbs picked up by a recycling company than it is to use a DTC. If he used a DTC, Mr. Lucas would need to pay for labor, training, PPE and \$250 to dispose of each drum containing up to 1000-1200 bulbs. Instead, he has his bulbs picked up at various locations directly by a recycler for \$0.24 each - and he doesn't have to address issues related to exposing people and environmental contamination that are likely to occur when DTCs are used.

### **Information for schools on recycling fluorescent bulbs in Minnesota**

Fluorescent light bulbs from schools should be recycled by a reputable recycler - recycling is the law in Minnesota. Schools that are members of the Dept. of Administration's Cooperative Purchasing Venture (CPV) can use the state contract for lamp recycling. (Individuals should consult their county or electric utility for information on residential recycling of fluorescent bulbs.) The MPCA lamp webpage contains additional information on fluorescent bulbs and bulb recycling (<http://www.pca.state.mn.us/waste/lightbulbs.html>).

MPCA and MDH are aware that DTCs are being heavily marketed to schools, hospitals, residential complexes and businesses. In the interest of maintaining healthy schools we are taking this opportunity to inform you of state policy. If you have additional questions, please see below:

- MPCA on fluorescent bulbs and DTCs: <http://www.pca.state.mn.us/waste/lightbulbs.html>
- Minnesota business material management webpage: <http://www.rethinkrecycling.com>
- MDH Healthy Schools website: <http://www.health.state.mn.us/divs/eh/schools/mercury.html>
- John Gilkeson at the MPCA

tollfree 1-800-657-3864  
metro area telephone: 651-757-2391  
e-mail: [john.gilkeson@state.mn.us](mailto:john.gilkeson@state.mn.us)

**For more information contact:**

MDH/Site Assessment and Consultation: (651) 201-4897 or 1 (800) 657-3908, press "4" and leave a message.

To request this document in another format, call (651) 201-5000 or TDD: (651) 201-5797.