



Mercury-Free Thermometers

Introduction

In accordance with a 2009 University [directive](#), mercury thermometers and other devices containing mercury, such as sphygmomanometers, must now be replaced by non-mercury devices in all UMDNJ facilities. In the event that no reasonable substitute is available, the Department of Environmental and Occupational Health and Safety Services (EOHSS) will consider granting an exception to this directive; any such decisions will be at the discretion of the Director of EOHSS.

Even though the use of mercury-filled thermometers has been discouraged in UMDNJ laboratories for years, mercury spills, usually the result of a thermometer breaking in a water bath or heating block, are the most common hazardous material incident in UMDNJ research laboratories. Therefore, as of April 30, 2009, mercury thermometers must be replaced with non-mercury-containing thermometers in all UMDNJ laboratories.

Mercury spills are both costly and disruptive to the University's operations. Elemental mercury is volatile at room temperature. When mercury spills from a broken device, it forms droplets that can easily roll and accumulate in floor cracks, behind base coving, and under furniture and other objects, occasionally requiring these items to be moved to allow a clean-up of the materials.

Mercury vapor is odorless, colorless, and tasteless. Inhalation of vapors is the most serious route of exposure for mercury. It can take several hours to clean up simple spills, and disposal of the clean-up materials for a single mercury thermometer spill costs hundreds of dollars per incident. The cost of decontaminating an incubator or other piece of equipment can be several thousand dollars and can render the equipment unusable.



Clean-up of beads of mercury using a mercury vacuum

Only non-mercury thermometers are allowed in UMDNJ laboratories.

Most mercury thermometers in UMDNJ laboratories have already been replaced with non-mercury units. With this [directive](#), the University is formalizing the program to eliminate the use of mercury wherever possible. It is also being implemented to enable the establishment of procedures to ensure that new mercury-containing devices are not brought back into the University after they have been replaced.

Any mercury-containing devices that need to be disposed of or taken out of service should be disposed of through EOHSS. Contact your campus EOHSS office to arrange for disposal or if you have questions; contact information is posted at <http://www2.umdnj.edu/eohssweb/publications/directory.htm>.

Mercury Toxicity

Elemental mercury is a potent neurotoxin that is hazardous to human health. Exposure to sufficiently high levels of mercury vapor in the air can cause permanent damage to the nervous system, brain, liver, kidneys and developing fetus. It can induce nausea, vomiting or diarrhea; increases in blood pressure or heart rate; skin rashes or eye irritation and is known to bioaccumulate in the fatty tissues of the body. Mercury affects numerous different brain functions and a variety of symptoms may occur. These include changes to personality, sensation deficits, and difficulties with memory.

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Source: <http://wbgustream.bgsu.edu/bgsu/epa/index-qt.html>

This [video](#) documents an experiment conducted by BGSU, Ohio EPA, and Rader Environmental Services. Toxic mercury vapors can not be seen with the naked eye. However, mercury vapors can create a shadow when placed between a short-wave ultraviolet light source and a fluorescent background.

Mercury-Free Thermometer Alternatives

The following alternatives to mercury thermometers are available from most laboratory supplies:

Type	Characteristics	Price compared to mercury thermometer	Accuracy compared to mercury
Spirit-filled, mercury-free thermometers	Non-hazardous. Filled with petroleum-based mineral spirits	Comparable	Comparable
Alcohol-based, mercury-free thermometers	Non-hazardous	Comparable	Tends to be less accurate
Microprocessor-based thermometers	Non-hazardous, digital readout	More Expensive	Comparable

Links to examples of ordering information for teflon-coated and non-mercury thermometers are posted at http://www2.umdnj.edu/eohssweb/publications/merc_therm_alternatives.pdf.

[Requirements about mercury thermometers have been added to the Laboratory Safety Plan.](#)

The Office of Emergency Management and Occupational Health and Safety (EMOHS) is working to build a safe, healthful, and resilient University community through collaborative partnerships, with everyone doing their part to accomplish this goal.

Contact Information:



Newark
(973) 972-4812 ♦ Fax (973) 972-3694

Piscataway/New Brunswick
(732) 235-4058 ♦ Fax (732) 235-5270

Scotch Plains
(908) 889-2486 ♦ Fax (908) 889-2496

Camden/Stratford
(856) 566-6189 ♦ Fax (856) 566-6352

Website ♦ <http://www2.umdnj.edu/eohssweb>

EOHSS Staff Directory
<http://www2.umdnj.edu/eohssweb/publications/directory.htm>

Examples of Mercury-Free Thermometers

Thermometer Type	Temperature Range	Item	Supplier	Price [†]
Nontoxic, biodegradable liquid- and dye-filled	Various ranges from: -100 to 500 F -73 to 260 C	Enviro-Safe[®] Thermometers	Lab Safety Supply VWR	\$11 – \$58
Lab Safety Supply: http://www.labsafety.com/search/thermometers/+626/38440/ VWR: http://www.vwrsp.com/catalog/product/index.cgi?catalog_number=61019-034&highlight=61019-034&inM=1				
Nontoxic, biodegradable liquid- and dye-filled	Various ranges from: -35 to 300 F -37.2 to 148.8 C	Ever-Safe [®] Laboratory Thermometers	Lab Safety Supply VWR	\$14 - 17
Lab Safety Supply: http://www.labsafety.com/search/Eversafe/24551510/ VWR: http://www.vwrsp.com/catalog/product/index.cgi?catalog_number=61019-034&highlight=61019-034&inM=1				
Spirit-filled	Various ranges from: 64.4 to 230 F 18 to 110	VWR [®] Dry Bath/Block Heater Thermometers	VVWR	\$53
http://www.vwrsp.com/catalog/product/index.cgi?catalog_number=61018-120&inE=1&highlight=61018-120				
Nonhazardous, nontoxic, and biodegradable liquid	Various ranges from: -20 to 260 C 0 to 440F	VWR [®] Easy-Read [®] Thermometers	VWR	\$11 - 22
http://www.vwrsp.com/catalog/product/index.cgi?catalog_number=33600-012&inE=1&highlight=33600-012				
Spirit-filled	Various ranges	VWR [®] Precision Thermometers	VWR	\$62 - 365
http://www.vwrsp.com/catalog/product/index.cgi?catalog_number=61222-626&inE=1&highlight=61222-626				
Spirit-filled	Various ranges	Ever Ready Non-mercury Thermometers	Fisher Safety	\$26**
http://www.fishersci.com/wps/portal/PRODUCTDETAIL?productId=764676&catalogId=29102&pos=1&catCode=SA_SC&fromCat=yes&keepSessionSearchOutPut=true&brCategoryId=null&hpi=y&fromSearch=Y				
Spirit-filled	Various ranges from: -148 to 122 F 100 to 50 C	Fisherbrand* Low-Temperature Total Immersion Thermometer	Fisher Safety:	\$39**
http://www.fishersci.com/wps/portal/PRODUCTDETAIL?productId=674082&catalogId=29102&pos=3&catCode=SA_SC&fromCat=yes&keepSessionSearchOutPut=true&brCategoryId=null&hpi=y&fromSearch=Y				
Micro-processor-based	Various ranges	VWR [®] Digital Hand-Held Thermometer with Puncture Probe	VWR	\$328
http://www.vwrsp.com/catalog/product/index.cgi?catalog_number=61220-157&inE=1&highlight=61220-157				
Micro-processor-based	Various ranges	Handheld Thermocouple Thermometers	Lab Safety Supply	\$183
http://www.labsafety.com/search/digital+thermometers/38354/				

Ordering and Price information effective as of October 2008.

[†]These prices reflect the supplier's list price. Please contact General Stores for UMDNJ discounted price. Buying in bulk quantities may also allow for additional savings

** You must be logged into the Fisher Scientific website to view price information

http://www2.umdj.edu/eohssweb/publications/merc_therm_alternatives.pdf