Ultraviolet Radiation Burns from High Intensity Metal Halide and Mercury Vapor Lighting Remain a Public Health Concern

Notice to Schools and Other Indoor, All-Purpose Facilities Where Light Bulbs are Subject to Damage

Broken and unshielded high intensity metal halide and mercury vapor light bulbs continue to cause eye and skin injuries, particularly in school gymnasiums. To prevent these incidents from recurring, FDA recommends the following in schools and other indoor, all-purpose facilities where the light bulbs may be broken:

- replacement of open or wire grid fixtures with enclosed fixtures, or
- replacement of non-self extinguishing “R” type high intensity metal halide and mercury vapor light bulbs used in open or wire grid fixtures with self-extinguishing “T” type light bulbs.

The 2005 National Electrical Code addresses high intensity metal halide and mercury vapor light bulbs installed in newly constructed or renovated indoor sports or all-purpose facilities. Because the bulbs in such areas are subject to physical damage, they must be installed in fixtures that are fully enclosed by a lens of glass or plastic to protect the bulb from breakage.

The best way to reduce the risk of burns is to use fully-enclosed fixtures or self-extinguishing “T” type mercury vapor light bulbs in facilities where the public can be exposed to the ultraviolet (UV) radiation from a broken bulb.

Background

The Food and Drug Administration (FDA) recently learned that more than 100 people were exposed to short-wave UV radiation from a broken mercury vapor light bulb at a high school gym. Eighteen people went to the hospital with severe eye and skin burns. Personnel investigating the event confirmed that a broken, non self-extinguishing "R" type metal halide bulb caused the injuries.

Similar incidents have been reported in the past involving “R” type light bulbs installed in open and wire grid fixtures. Most injuries have occurred inside school gyms, after the light bulbs were struck and partially broken by balls or other sports equipment. FDA is not aware of any incidents involving “T” type light bulbs, or involving light bulbs installed in fixtures fully enclosed by glass or plastic.

What are Halide and Mercury Vapor Light Bulbs?

Metal halide and mercury vapor bulbs are bright, long-lasting sources of light, most often used to light streets, gyms, sports arenas, banks, and stores. The

bulbs have an inner quartz tube, containing the mercury vapor discharge, enclosed by an outer glass bulb that filters out harmful short-wavelength UV radiation. If the outer bulb breaks and the inner tube continues to operate unshielded, intense UV radiation is emitted. UV exposure at this level can cause eye and skin burns, as well as blurred or double vision, headaches, and nausea.

Types of halide and mercury vapor light bulbs sold in the U.S. include:

- “T” type light bulbs with a self-extinguishing feature that shuts off the light within 15 minutes after the outer bulb is broken. “T” type light bulbs may be used in either open fixtures or enclosed fixtures. FDA requires packaging for “T” type light bulbs to include the following statement:

  “This lamp should self-extinguish within 15 minutes after the outer envelope is broken or punctured. If such damage occurs, TURN OFF AND REMOVE LAMP to avoid possible injury from hazardous shortwave ultraviolet radiation.”

- “R” type light bulbs are not self-extinguishing. “R” type light bulbs should only be installed in light fixtures that are fully enclosed by a lens of glass or plastic to shield people from the UV radiation, or in areas where people will not be exposed to UV radiation if the outer bulb breaks. FDA requires packaging for “R” type light bulbs to include the following statement:

  "WARNING: This lamp can cause serious skin burns and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured. Do not use where people will remain more than a few minutes unless adequate shielding or other safety precautions are used. Lamps that will automatically extinguish when the outer envelope is broken are commercially available."

Precautions for Facilities that Use Metal Halide and Mercury Vapor Lighting

All schools and other indoor, all-purpose facilities using metal halide and mercury vapor lighting should inspect both the light bulb and the fixture on a regular basis to ensure that they are not broken. **With the light fixture turned off**,

- Check the light fixture. Replace any fixture that is damaged. Damaged, open fixtures, or fixtures with wire guards DO NOT protect the bulb from breakage and will not protect the public from UV radiation.

- Check the bulbs. Replace any light bulbs that are missing, broken, or punctured.

- Ensure light bulbs are installed in appropriate fixtures. Self-extinguishing “T” type light bulbs should be installed in open fixtures or fixtures with wire guards. Non self-extinguishing “R” type light bulbs should only be installed

in light fixtures that fully enclose the light bulb and have a lens of glass or plastic to protect the light bulb from breakage and protect the public from UV radiation.

- School supervisors should make sure that those responsible for the maintenance of these lighting systems fully understand the manufacturer's warnings on product packaging, as well as Federal, State, and local guidelines to reduce the risks associated with these products.

If a metal halide or mercury vapor light bulb is broken during use,

- **TURN OFF THE LIGHT IMMEDIATELY.**
- Move people out of the area as quickly as possible.
- Advise people exposed to the damaged bulb to see a doctor if symptoms of skin burns or eye irritation occur.
- Report injuries from damaged light bulbs to the bulb manufacturer, your state health department, and the nearest FDA district office.
- Check to make sure the light fixture is turned off before replacing the damaged light bulb. It is important to retain the broken bulb to identify the bulb type and manufacturer, and to assist with any investigation conducted after the incident.

The National Electrical Manufacturer's Association (NEMA) web site contains:

- Additional information on care and maintenance of high intensity metal halide and mercury vapor lamps used in schools: http://www.nema.org/stds/halide-schools.cfm#download, and
- Best practices for metal halide lighting systems: http://www.nema.org/stds/LSD25.cfm.

For more information on FDA's web site about high intensity mercury vapor lighting, see http://www.fda.gov/cdrh/radhlth/mercury-vapor.html

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