

*This paper was revised January 30, 2006 based upon updated information. Information on UV exposure has been added.*



**From the Front Page of The Oregonian,  
Thursday, November 18, 2004:**

## **“Teachers hurt by faulty light get assurances”**

**“Lake Oswego educators burned by a broken halide bulb are told the effects should be temporary.”**

Sixty Lake Oswego, Oregon teachers suffered skin burns and temporary blindness after sitting under a broken metal halide lamp. What happened at Bryant Elementary School is unusual, but this was also a preventable situation. These teachers suffered from exposure to shortwave UV radiation – effects normally associated with extreme sunburn. The effects are dependant upon exposure time and intensity but are not necessarily temporary. This happened due to a compounding of conditions as discussed below.

Condition #1: An older-style metal halide lamp was installed. Some metal halide lamps are self-extinguishing, incorporating integral electrical safety disconnects; and others are listed for use only in enclosed luminaires. Most older-style lamps are completely unprotected. Unfortunately with older luminaires, there were no mechanical safety-interlock devices to prohibit an unprotected lamp from being installed.

Condition #2: The outer envelope of the lamp was broken or punctured but the inner envelope (the ‘arc tube’) was not compromised. A rare occurrence, but it does happen. The outer envelope blocks shortwave UV radiation. If the luminaire has a lens below the lamp, the lens is an effective UV blocker as well.

Condition #3: The luminaire at Bryant originally had a bottom lens. The lens had been broken a short time before this event. This led to the lighting version of the perfect storm - an unprotected arc tube without a protective envelope or cover glass.

Oregon OSHA and an environmental contractor recreated the incident with a broken lamp similar to the one at Bryant Elementary School. While intact lamps were measured at levels within accepted national standards for exposure, the broken lamp produced maximum allowable daily exposure levels in a period of eight minutes.

All lamp manufacturers include warnings on lamp packaging to advise end-users of these potential dangers of metal halide lamps. Each of the big three lamp manufacturers manufacture lamps that will reduce these occurrences to zero. Lamps should be selected carefully for the protection of the building occupants. Two types of protected lamp are available.



'Self-Extinguishing' lamps: These lamps are designed to be self-extinguishing if the outer jacket is compromised to prevent exposure to ultraviolet radiation.

- General Electric: 'Safe-T-Guard Multi-Vapor (MVT)' series
- Osram/Sylvania: 'Metalarc Safeline' series
- Philips: 'Safety Lifeguard' series

'Self-Extinguishing' lamps should be used in all luminaires that incorporate a glass protective lens. This will protect against the type of failure experienced at Bryant Elementary School.

'Open Fixture Rated' lamps: An internal shield is incorporated within the lamp that protects against violent arc tube failure and outer envelope rupture. These lamps are also self-extinguishing.

- General Electric: 'Protected Multi-Vapor' series
- Osram/Sylvania: 'Metalarc Pro-Tech (MP)' series
- Philips: 'Protected Mastercolor'; 'Protected Metal Halide' series

'Open Fixture Rated' lamps should be used in any luminaire using either an open lamp chamber or an unprotected plastic lower lens. This lamp protects against the failure above, plus offering protection against arc tube rupture. All currently manufactured open metal halide luminaires incorporate sockets with a mechanical interlock that prevents an improper lamp from being installed.

What can you do as an owner? All existing metal halide luminaires should be inspected. Any luminaire with a mechanical interlock socket is OK. The socket will prevent lamps other than an 'Open Fixture Rated' lamp from being installed. All other luminaires should be fitted with a tempered glass cover and a self-extinguishing lamp.

Metal halide lamp sources are high quality, high efficacy lighting tools with wide application in architectural, institutional and industrial applications. They offer the advantages of low energy use, good color, long life and compact size. They are often the best choice for many applications. Like many products, they must be thoughtfully applied and properly maintained to realize the advantages they offer throughout their service life.

## The Luma Team

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Additional information is available here:  
<http://home.comcast.net/~uvlightburns/wsb/html/view.cgi-home.html-.html>

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