

## THE METAL HALIDE LAMP AND CONTENTS

These lamps consist of an inner quartz arc tube enclosed in an outer envelope of heat-resistant glass. Depending on the lamp type, the envelope is either clear or coated with one of two different materials. The "MVR" and "MVT" lamps are coated with a phosphor material while the "MXR" lamps are coated with a diffusing material.

The phosphor used on outer envelope of the coated lamps consists of yttrium vanadate phosphate. This material, like most vanadium compounds, is relatively insoluble, and appears to have a much lower toxicity than vanadium pentoxide but may elicit some similar symptoms at high exposure levels. Excessive inhalation exposure to vanadium pentoxide may result in irritation of the nasal passages and respiratory tract, cough, difficulty in breathing, and bronchitis. The yttrium vanadium phosphate from the breakage of one or a small number of lamps should not, however, result in a significant exposure.

The material used as a diffuser the "MXR" lamps is a specially prepared kaolin clay which contains no crystalline silica or asbestos as impurities. These types of clays are generally considered to be relatively toxicologically relatively inert.

The quartz arc tube contains a small amount of mercury, ranging from 20 milligrams in a 75 watt up to 250 mg. in a 1000 watt lamp. The arc tube contains a small amount of the inert gas argon used as a fill gas. It also contains trace amounts of other materials, but there would be no significant exposure from lamp breakage. The air concentration of mercury resulting from the breakage of one or a small number of lamps should result in no significant exposure to the individual. However, when breaking a large number of lamps for disposal, appropriate monitoring and controls should be implemented to control airborne levels or surface contamination. We recommend that such work be done in a well ventilated area, and local exhaust ventilation or personal protective equipment may be needed.

Also contained in the arc tube are small amounts of sodium and scandium iodide, and in some cases thorium iodide. None of these materials are expected to be a hazard in the small quantities present in the arc tube. The coating on the ends of the arc tube is aluminum oxide, a material generally considered to have a low order of toxicity.

The quartz arc tube, when operating, generates a considerable amount of ultraviolet radiation. The UV is filtered to acceptable levels by the glass outer envelope during normal use. However if the outer envelope is broken, this filtering is lost. Thus those lamps having ordering codes beginning with the letters "MVR" or "MXR" have the following warning notice required under Federal Regulation 21 CFR 1040.30:

"WARNING: This lamp can cause serious skin burn and eye inflammation from shortwave ultraviolet radiation if outer envelope of the lamp is broken or punctured, and the arc tube continues to operate. Do not use where people will remain for more than a few minutes unless adequate shielding or other safety precautions are used. General Electric Company has commercially available SAF-T-GARD mercury and Multi-Vapor lamps that will automatically extinguish when the outer envelope is broken."

The self-extinguishing lamps referred to above have order codes beginning with the letters "MVT". If the outer glass envelope of a SAF-T-GARD lamp is broken, although the arc tube will have self-extinguished, its support structure will still be electrically connected and could present an electrical shock hazard. Therefore, regardless of the type, if the outer envelope of the lamp has been broken, the lamps should be replaced after turning the power off.

A Toxic Characteristic Leachate Test (TCLP) conducted on the lamp for lead could cause the lamp to be classified as a hazardous waste. Metal halide lamps use lead solder on the base of the lamp. The lead used in the solder should pose little risk of exposure under normal use and handling. While small numbers of these lamps placed in ordinary trash should not appreciably effect the nature or method of disposal of the trash, under some circumstances disposal of large quantities may be regulated. You should review your waste handling practices to assure that you dispose of waste lamps properly.

I hope this will answer any concerns that you may have regarding these lamps. Should you have any further questions, please call me at (216) 266-3349.

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and Safety Department

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