



## Lamp Material Information Sheet – Ceramic Metal Halide Lamp

### Material Safety Data Sheets (MSDS) Information and Applicability

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The Material Safety Data Sheet (MSDS) requirements of the Occupational Safety and Health Administration (OSHA) for regulated chemicals under, 21 CFR 1900.1200 are not applicable to manufactured articles. GE Metal Halide lamps are classified as articles, and therefore exempt from this regulation.

No material contained in a lamp is released during normal use and operation.

The following information is provided as a courtesy service to our customers. This Lamp Material Information Sheet contains applicable Material Safety Data Sheet information.

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### I. Product Identification

GE Ceramic Metal Halide Lamps – CMH®  
Applicable Lamp Types: ConstantColor® CMH®

GE Consumer & Industrial - Lighting  
1975 Noble Road  
Nela Park  
Cleveland, OH 44112  
(216) 266-2222

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### II. Lamp Materials and Hazardous Ingredients

#### Glass

These lamps consist of an inner arc tube composed of polycrystalline alumina (PCA) enclosed in an outer envelope of either heat-resistant glass or quartz. Depending on the lamp type, the glass envelope is either clear, coated with a diffusing material, or has an inner surface layer of a metallic substance with reflective properties.

#### Bulb Coatings

The material used on the inside surface as a diffuser in coated lamps is specially prepared kaolin clay that contains no crystalline silica or asbestos as impurities. These types of clays are generally considered to be toxicologically relatively inert materials.

#### Arc Tube

The ceramic arc tube contains a small amount of mercury, ranging from 2 milligrams in low wattage lamps, up to 44 mg in some high wattage types. Further, the arc tube contains a small amount of inert gas, argon, used as a fill gas. Argon is a stable, chemically inert gas. CMH lamps also mix a small quantity of Kr-85 with argon inside the arc tube. Krypton-85 is used to improved ionization and startability of the lamp. If present, the activity level of Kr-85 will range from 2.7–262 nanocuries (nCi) (0.1–9.3kBq). There would be no significant exposure from lamp breakage.



Also contained within the arc tube are small amounts of other materials, referred to as the dose. The combination of these materials within the plasma discharge creates the “white light” of CMH lamps. These compounds, or metallic salts, may also include various iodides of sodium, thallium, dysprosium, thulium, calcium, cesium and cerium or other rare earths. None of these materials is expected to be a hazard in the small quantities present in the arc tube. While thallium is not listed as a carcinogen, toxic fumes could be emitted if heated to decomposition. Avoid breaking the ceramic arc tube. If the arc tube is broken, handling in a well-ventilated area, and local exhaust ventilation or personal protective equipment may be needed. Comply with all applicable regulations.

### **Quartz and Ceramic**

Some CMH arc tubes are sealed within a quartz capsule. Quartz in the form of fused or amorphous silica has not been identified as a carcinogen. The ceramic arc tube is made of polycrystalline alumina (PCA), a material generally considered to have a low order of toxicity.

Some lamps may contain a cement to affix the base to the bulb. This cement may include amorphous silica, magnesium phosphate and zirconium silicate. In its solidified form, these materials do not present an exposure risk on intact lamps. Crushing or grinding these materials could be mildly irritating to skin, eyes and respiratory system. Airborne exposure to zirconium silicate dust should not exceed 5mg/m<sup>3</sup> in a time weighted 8-hour period.

### **Metals**

Internally, the support wires used in the lamp construction are made from nickel-coated iron, stainless steel, molybdenum and niobium while the electrodes are tungsten. Many of the metal halide types will use a nickel-plated brass base and have lead-soldered connections to that base. Reflector lamps, identified as “MR” or “PAR” may contain a thin layer of aluminum on the inside surface of the glass to act as a reflector for directional control of the light.

### **Getters**

Getters employed within the outer envelope are used to extend the life of the lamp. Ceramic metal halide lamps typically use a zirconium alloy getter. These getters are in solid form and do not present an exposure risk on intact or broken lamps.

### **Gases**

The outer envelope and inner quartz capsule of some CMH lamps are filled with nitrogen to a sub-atmospheric pressure. Nitrogen is a stable, chemically inert gas.

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## III. Health Concerns

### **Mercury Exposure**

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, if breaking a large number of lamps for disposal, appropriate monitoring, controls, and equipment should be implemented to control airborne mercury and dust levels or surface contamination. Such work should be done in a well-ventilated area, and local exhaust ventilation or personal protective equipment may be needed. Comply with all applicable regulations.

### **Ultraviolet (UV) Radiation**

The CMH arc tube, when operating, generates a considerable amount of ultraviolet radiation. The UV is filtered to acceptable levels by the “UV Control” quartz capsule or by the glass outer envelope during normal use. However, if the quartz capsule or outer envelope is broken, the UV filtering is lost. Therefore, CMH lamps that could pose a risk of UV hazard have the following R-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. Do not use where people will remain for 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 or punctured are commercially available.***

***This lamp certified to comply with FDA radiation performance standards, 21 CFR Subchapter J. USA: 21 CFR 1040.30 Canada: SOR/80-381"***

The self-extinguishing feature referred to above does not currently exist for CMH lamp types. Further, if the outer envelope of the lamp is broken, 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 is broken, turn the power off before replacing the lamps.

For additional information on protection from UV radiation, visit the FDA website for more information:  
<http://www.fda.gov/cdrh/radhealth/products/urburns.html>

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#### IV. Fire and Explosion Data

***WARNING: Unexpected lamp rupture may cause injury, fire, or property damage. Do not use lamp beyond rated life and adhere to all applicable caution and warning notices.***

An arc tube rupture can burst and shatter the outer quartz or glass bulb resulting in the discharge of glass fragments and extremely hot quartz or ceramic particles (as high as 1100°C). There is a risk of personal injury, property damage, burns, and fire.

Caution and warning notices for each GE product may be viewed online at <http://www.gelighting.com/>

Further guidance on the application and use of Ceramic Metal Halide lamps is available from NEMA document LSD 25, Best Practices for Metal Halide Lighting System, Plus Questions and Answers about Lamp Ruptures in Metal Halide Lighting Systems. LSD 25 may be viewed online at <http://www.nema.org/>

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#### V. Disposal Concerns

##### **TCLP**

A Toxicity Characteristic Leaching Procedure (TCLP) test conducted on the lamp for lead or mercury could cause the lamp to be classified as a hazardous waste. Some Metal Halide lamps use lead solder on the lamp base and mercury in the arc tube. The lead solder or mercury vapor should pose little risk of exposure under normal use and handling. While small numbers of these lamps placed in the ordinary household trash should not appreciably affect the nature or method of disposal of the trash in most states, under some circumstances disposal of these lamps is regulated. Many businesses in the United States manage these lamps as Universal Wastes. You should review your waste handling practices to assure that you dispose of waste lamps properly.

Some states require all mercury containing lamps to be recycled, contact your state environmental department for any regulations that may apply. To check state regulations or to locate a recycler, go to <http://www.lamprecycle.org/> or call 1-800-435-4448.