

**Material Safety Data Sheet (MSDS) LED Lamps**

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INFORMATION AND APPLICABILITY

Technical Consumer Products believes that under the Occupational Safety and Health Administration (OSHA) Hazards Communications Standard, a lamp (light bulb) is exempted as an "article", and that as such, does not require an MSDS. The original OSHA Standard defined an article as something that: 1) is formed to a specific shape and design, 2) has end use functions dependent upon its shape and design, and 3) does not release or otherwise result in an exposure to a hazardous chemical under normal conditions of use. In February 1994, OSHA amended the Hazard Communication Standard and modified part 3 of the above to read: 3) does not release more than very small quantities of a hazardous chemical under normal conditions of use. State and local regulations also contain similar exemptions for such articles. Materials contained in the lamp are not released during normal use and operation. The following information is provided as a courtesy to our customers.

PRODUCT AND COMPANY IDENTIFICATION

Description: Trade Name (As labeled) LED Lamps (For general lighting application) (Consists of LEDs and drivers as a unit)
 Manufacturer: Technical Consumer Products Inc. • Shanghai, Jensen LTD. • 300 Lena Drive • Aurora, Ohio 44202 • 1-800-324-1496

COMPOSITION/INFORMATION ON INGREDIENTS

THERE ARE NO KNOWN HEALTH HAZARDS FROM EXPOSURE TO LAMPS THAT ARE INTACT.

Lamp Assembly – Glass and Metal – The glass is made from soda lime similar to that used throughout the glass industry for other common consumer items. The metals for the adapters and LEDs are generally made from various amounts of aluminum, tin, lead, copper, zinc, and nickel. None of these materials would present a potential hazard in the event of breakage of the lamp, aside from the hazard due to broken glass.

Phosphor in LEDs – (nuisance dust) phosphate mix using manganese, rare earth elements such as lanthanum, and yttrium as either an oxide or as a phosphate, along with a barium/aluminum oxide all are tightly bound in the phosphor matrix. These phosphors produce better lamp efficiency and color rendition. The phosphor components may vary slightly depending on the color of the lamp. Some lamps may contain a thin coating of tin oxide inside the glass.

LEDs – The LEDs consist of metal and InGaN (Indium Gallium Nitride) semiconductor chip. Due to their insolubility and inertness, these materials do not present a significant hazard.

PHYSICAL PROPERTIES Not applicable to intact lamp.

EXPLOSION HAZARDS When exposed to high temperature, toxic fumes may be released from broken lamps.

HEALTH CONCERNS THERE ARE NO KNOWN HEALTH HAZARDS FROM EXPOSURE TO LAMPS THAT ARE INTACT. No adverse effects are expected from occasional exposure to broken lamps. As a matter of good practice, avoid prolonged or frequent exposure to broken lamps unless there is adequate ventilation. The major hazard from broken lamps is the possibility of sustaining glass cuts.

Phosphor	There have been no significant adverse effects on humans by ingestion, inhalation, skin contact, or eye contact. Antimony, manganese, yttrium and tin compounds are characterized by OSHA as hazardous chemicals, however, due to their insolubility, relatively low toxicity and small amount present in the phosphor and lamp, these materials do not present a significant hazard in the event of breakage of the lamp.
Glass	Glass dust is considered to be physiologically inert and as such has an OSHA exposure limit of 15-mg/cubic meter for total dust and 5-mg/cubic meter for respirable dust. Perform normal first aid procedures. Seek medical attention as required.
Inhalation	If discomfort, irritation or symptoms of pulmonary involvement should develop, remove from exposure and seek medical attention.
Ingestion	In the unlikely event of ingestion of a large quantity of material, seek medical attention.
Contact Eye/Skin	Wash eyes/skin, including under eyelids, immediately with copious amounts of water and Seek medical attention.

PROCEDURES FOR DISPOSAL OF LAMPS Take usual precautions for collection of broken glass. Place materials in closed containers to avoid generating dust. For field disposal the lead in the soldering is considered hazardous waste and must be disposed of by applicable federal, state and local regulations.

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