

Product Safety Data Sheet: Fluorescent Lamps

Section 1: Identification

This Safety Data Sheet covers fluorescent lamps that are used in accelerated weathering and lightfastness testing. It covers the products **QFS-40**, **UVB-313**, **UVA-340**, and **UVA-351**.

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Section 2: Hazard(s) Identification

The materials used in Fluorescent lamps are **not hazardous** in their normal operating state. Fluorescent lamps do produce ultraviolet (UV) light during operation, so eye and skin exposure may be hazardous.



Fluorescent lamps are efficient generators of ultraviolet light similar to that in sunlight. Exposure of a few minutes to unshielded lamps may cause painful sunburn or eye inflammation. As with sunlight, extensive or repeated exposures may lead to premature aging of the skin or permanent skin damage.

Sunburn and eye inflammation are delayed reactions. Symptoms (pain, redness, hot sensation) do not appear until 4 to 12 hours after UV exposure. After severe sunburn and eye inflammation, skin and eyes may be more sensitive to future UV exposures, including sunlight.

A broken lamp may generate a very small quantity of glass respirable dust, present a sharps hazard upon cleanup, as well as releasing the gases described in Section 3. Mercury in particular presents an acute health hazard. However, the level of chemical exposure from breaking one or a few lamps will not produce adverse health effects. *All of these fluorescent lamps are in compliance with the Restriction of Hazardous Substances (RoHS) directive.*

Below is some additional detail on hazardous chemicals present in trace amounts in lamps, which again are of no concern for intact lamps:

Mercury – Exposure to high concentrations of vapors for brief periods can cause acute symptoms such as pneumonitis, chest pains, shortness of breath, coughing, gingivitis, salivation, and possibly stomatitis. May cause redness and irritation as a result of contact with skin and/or eyes.

Lead – Ingestion and inhalation of lead dust or fume must be avoided. Irritation of the eyes and respiratory tract may occur. Excessive lead absorption is toxic and may include symptoms such as anemia, weakness, abdominal pain, and kidney disease. However, the chemical inertness and insolubility of this material is expected to reduce the potential for systemic lead toxicity.

Glass – Glass dust is considered to be physiologically inert and as such, has an OSHA exposure limit of 15 mg/m³ for total dust and 5 mg/m³ for respirable dust. The ACGIH TLVs for particulates not otherwise classified are 10 mg/m³ for total dust and 3 mg/m³ for respirable dust.

Phosphor – Inhalation of insoluble barium compounds has been reported to cause benign pneumoconiosis with no specific symptoms and no changes in pulmonary function.

Section 3: Composition/Information on Ingredients

Main ingredients present in fluorescent lamps are in the table below:

Chemical Name	CAS Number	% by mass	Exposure limits in air	
			ACGIH (TLV)	OSHA (PEL)
Glass (soda-lime)	65997-17-3	80-95	10	30
Mercury	7439-97-6	<0.20	0.025	0.1
Lead Oxide	1317-36-8	<0.21	0.05	0.05
Aluminium Oxide	1344-28-1	<0.20	10	15
Phosphor powder		<3.00		

Lamp phosphors and cathodes may contain small quantities of:

Chemical Name	CAS Number	Exposure limits in air	
		ACGIG (TLV)	OSHA (PEL)
Barium	7440-39-3	0.5	0.5
Barium Sulfate	7727-43-7		
Calcium	7440-70-2		
Strontium	7440-24-6		
Tungsten	7440-33-7	1.0	
Fluoride	16984-48-8	2.5	2.5
Manganese	7439-96-5	0.2	5.0
Tin	7440-31-5	2.0	2.0
Yttrium	7440-65-5	1.0	1.0
Magnesium	7439-95-4		
Antimony	7440-36-0	0.5	0.5
Antimony Trioxide	1309-64-4	0.5	0.5
Zinc	7440-66-6		
Europium	7440-53-1		
Cerium	7440-45-1		
Lanthanum	7439-91-0		
Terbium	7440-27-9		
Aluminium	7429-90-5		
Lead	7439-92-1	0.15	0.05
Phosphorus	7723-14-0	0.1	0.1
Thallium	7440-28-0	0.1 (skin)	0.1 (skin)

Section 4: First-Aid Measures

Fluorescent lamps are not hazardous in their normal operating state and no first-aid measures are relevant.

Glass cuts from broken lamps can be treated using normal first-aid procedures. Eye and skin contact should be treated with thorough washing and medical attention if irritation persists.

Section 5: Fire-Fighting Measures

Materials in fluorescent lamps are not combustible nor flammable and fire-fighting measures will not be necessary. Under extreme heat the lamp may crack or melt.

Section 6: Accidental Release Measures

No special precautions are required for Fluorescent lamps under normal conditions.

The quartz glass from a broken Fluorescent lamp can pose a sharps hazard and caution must be taken in handling a broken fluorescent lamp.

Fumes may be released from a broken fluorescent lamp and may be toxic as indicated in the table in Section 3.

Section 7: Handling and Storage

Fluorescent lamps (when intact) should be stored and transported in corrugated cardboard packaging.

For broken lamps, it is recommended to use ventilation to keep exposure levels below PEL limits. If not available, respirators can be used. Cut- and puncture-resistance gloves should be used when breaking lamps or handling broken lamps. A mercury-rated vacuum cleaner should be used for cleanup.

Lamps should be handled using safety glasses and skin protection, such as cotton gloves.

Section 8: Exposure Controls/Personal Protection

Fluorescent lamps emit ultraviolet (UV) radiation, which may cause severe sunburn or eye inflammation. Operators must avoid exposure and use lamps only in fixtures that shield operators and laboratory occupants.

If exposure to fluorescent lamps is necessary, wear UV-absorbing goggles. Never look at lighted UV lamps without UV absorbing goggles. Protect skin with opaque clothing or a sunscreen lotion with sun protection factor (SPF) of 20, not a “suntan” lotion.

Individuals with light complexions are more susceptible to UV light, and some individuals are allergic to UV. Also, many common medications increase sensitivity to UV.

Section 9: Physical and Chemical Properties

Fluorescent lamps consist of a quartz tube with a diameter up to 4 cm and a length of up to 300 cm filled with gases.

Fluorescent lamps are not flammable nor explosive and are not subject to boiling or melting. The quartz is brittle and can crack if impacted. Quartz glass can soften at high temperatures – well above temperatures experienced in normal use.

Section 10: Stability and Reactivity

Fluorescent lamps are not chemically reactive and are highly chemically stable under storage and operating conditions. Hazardous reaction or polymerization will not occur.

Fluorescent lamps can be attacked by hydrofluoric acids.

Mechanical impact can cause the glass jacket of the lamp to shatter.

Section 11: Toxicological Information

Fluorescent lamps do not pose a toxicological hazard during normal operation or even upon breakage of a small number of lamps.

Section 12: Ecological Information (non-mandatory)

n/a

Section 13: Disposal Considerations (non-mandatory)

When discarding the lamps, disable them to prevent unauthorized use. To disable lamps, remove two of the end-pins with a wire cutter or pliers. Do not break lamps.

Materials must be placed in closed containers to avoid dust generation. Toxicity characteristic leaching procedure (TLCP) testing should be conducted on lamp waste products to determine disposal requirements. Although some states have regulations for lamps containing mercury, lamps passing the TLCP test are considered to be non-hazardous waste in most states. Consult local and state regulatory bodies for guidance on proper fluorescent lamp disposal.

Section 14: Transport Information (non-mandatory)

No special precautions are needed for shipping of Fluorescent lamps from a safety standpoint, though they should be packaged to avoid breakage.

Section 15: Regulatory information (non-mandatory)

N/A

Section 16: Other Information

The effects of UV lamps depend on duration of exposure, distance from lamps and percentage of lamp surface that is visible. The American Conference of Governmental Industrial Hygienists publishes Threshold Limit Values (TLV) that represent conditions under which it is believed that nearly all workers may be repeatedly exposed without adverse effect. TLV's should be used as general guidelines in estimating the allowable time in which an individual can be exposed to UV light. Example times for UVB lamp exposure from a single exposed panel in a UV fluorescent test apparatus, based on TLV's, are given in the table below:

Exposed area	Distance (cm)	Allowable daily exposure (min)
Skin	5	1
Skin	30	6
Eyes	100	18

- Skin 5.0 cm from fluorescent lamp. Allowable daily exposure 1 minute
- Skin 30 cm from fluorescent lamp. Allowable daily exposure 6 minutes
- Eyes 100 cm from fluorescent lamp. Allowable daily exposure 18 minutes

Because every individual has a different sensitivity to UV light, a person may actually be more sensitive to UV light than allowed for in reference to TLV's. Thus, photosensitive individuals may need to take extra precautions when using fluorescent lamps.

Fluorescent lamps should not be used for any purpose other than QUV testing. These lamps are not helpful for plant growth or similar purposes.

This SDS was prepared in September 2016 by Q-Lab Corporation.

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