

# SAFETY DATA SHEET (SDS)

## SELF-LUMINOUS TRITIUM-POWERED LIGHTS and DEVICES

*including (but not limited to) commercial building safety signs, aircraft safety signs, markers, etc.*

### Section 1: Identification

**Product Identifier:** Self-luminous lights, signs and devices that use tritium gas as a power source.

**Synonyms:**  $^3\text{H}$ , Tritium, Hydrogen-3, T

**Recommended Use:** Incorporated into self-luminous safety lights and devices

**Company:** SRB Technologies (Canada) Inc., 320-140 Boundary Road, Pembroke, Ontario, Canada

**In case of emergency:** Dial 911 in Canada and USA

**In case of transport accident:** Call Canutec: 1-888-226-8832 or \*666 on cell phone in Canada

**For more information about this SDS:** Call SRBT: 1-613-732-0055, extension 122

### Section 2: Hazard(s) Identification

**Hazard Classification:** Physical hazard not otherwise classified – Category 1 (Radioactive material)

**Signal Word:** Danger

**Precautionary Statement:** Avoid breathing gas if light sources broken. Move broken light sources to well-ventilated area. Wash hands thoroughly after handling broken light sources.

**Hazard Statement:** Radioactive gas – low-energy beta radiation (no external radiation hazard)

**Symbol:**



**Important Note:** Tritium-powered self-luminous safety lights and devices are WHMIS Exempt products in Canada. Although nuclear substances such as tritium gas are exempt from the requirements of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), this SDS is intended to convey safety information in a format that complies with the GHS for use in jurisdictions outside of Canada.

### Section 3: Composition/ Information on Ingredients

Chemical Name	Synonym	CAS#	Conc.
Hydrogen-3	Tritium Gas	10028-17-8	<0.00001% by wt.

### Section 4: First-Aid Measures

*Exposure to tritium gas in virtually all cases associated with broken self-luminous safety lights and devices is not expected to result in measurable or significant physical hazards that require immediate first aid. Tritium gas presents an internal radiation hazard – there is no external radiation hazard – and as such, avoiding inhalation, ingestion and/or absorption ensures safety.*

**After skin contact:** If broken light sources are handled or contact occurs with bare skin, wash skin with soap and water to minimize absorption potential.

**After eye contact:** Flush eyes with water if significant eye contact is experienced. Gas disperses and dissipates very quickly in well-ventilated areas.

**After inhalation:** No first aid required – effective dose assessment may be warranted if inhaled in significant quantities.

**After swallowing:** Gas disperses and dissipates very quickly in well-ventilated areas, reducing the probability of ingestion.

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### Section 5: Fire-Fighting Measures

**Flammability:** Tritium gas is an isotope of hydrogen; physical quantity of tritium gas in light sources and devices is insufficient to result in a significant fire hazard upon release (dissipation is immediate, resulting in a concentration well below the flammability range of hydrogen gas).

**Suitable extinguishing agents:** Any extinguishing agent is suitable; dry chemical is preferred.

**Special protective equipment for firefighters:** None.

### Section 6: Accidental Release Measures

**Personal precautions:** If light sources are broken, or devices are damaged to the point of breakage of the light sources inside, vacate the area for five minutes in order to allow gas to dissipate. Don protective gloves if available in order to minimize contamination of skin when handling broken light sources or devices.

**Measures for environmental protection:** Quantity of tritium gas in self-luminous safety lights and devices is not significant with respect to physical hazards to the environment. Allow gas to dissipate. Contact environmental authorities for further guidance for reporting any incidents where tritium gas is released.

**Measures for cleaning/collecting:** Clean affected areas using outward to inward techniques. Use soap and water to collect all fragments of light sources, seal in plastic bag if available, and dispose in accordance with requirements of jurisdiction.

### Section 7: Handling and Storage

**Handling:** Handle tritium-powered self-luminous lights and devices with care.

**Storage:** No specific precautions or conditions – tritium-powered self-luminous devices are designed to be inherently safe during storage.

### Section 8: Exposure Controls/Personal Protection

Chemical Name	Inhalation Dose Coefficient (Sv/Bq) – Adult (CSA N288.1)	Inhalation Dose Coefficient (Sv/Bq) – Child (CSA N288.1)	Inhalation Dose Coefficient (Sv/Bq) – Infant (CSA N288.1)
Tritium gas/ 3H	2.0E-15	2.5E-15	5.3E-15

**General protective and hygienic measures:** Handle in accordance with good laboratory practices. Wash thoroughly after handling broken light sources or devices.

**Breathing equipment:** Not normally needed.

**Protection of hands:** Disposable gloves recommended when handling broken light sources or devices.

**Eye protection:** Not normally needed.

**Skin protection:** Disposable lab coat or equivalent recommended when handling broken light sources or devices.

**Engineering controls:** Broken light sources and devices should be handled only in well-ventilated areas.

### Section 9: Physical and Chemical Properties

**Form:** Gas - colorless

**Odor:** Odorless

**Odor threshold:** N/A

**pH:** N/A

**Melting point/melting range:** -254.54 C

**Boiling point/boiling range:** -248.12 C

**Flash point:** N/A

**Evaporation rate:** N/A

**Flammability:** 4

**Upper/lower flammability or explosive limits:** 4-74% in air

**Auto ignition temperature:** 520 C

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### Section 10: Stability and Reactivity

**Reactivity:** Low

**Chemical stability:** Stable

**Conditions to avoid:** Oxidation of tritium will generate tritiated water vapor.

**Incompatible materials:** None

**Hazardous decomposition products:** None

### Section 11: Toxicological Information

**Acute toxicity:** N/A

**Potential routes of exposure/potential health effects:**

- **Skin:** Yes
- **Eye:** Yes
- **Inhalation:** Yes
- **Ingestion:** Yes

**Carcinogenic effects:** Significant exposure to radioactive materials may result in delayed carcinogenic effects. These effects are not expected when dealing with the amount of tritium gas that is contained in self-luminous lights and devices.

**Mutagenic effects:** Significant exposure to radioactive materials may result in mutagenic effects. These effects are not expected when dealing with the amount of tritium gas that is contained in self-luminous lights and devices.

**Reproductive toxicity:** N/A

**Sensitization:** N/A

**Target organs:** N/A

*Note: Tritium light sources and devices contain small quantities of radioactive material. These materials do not present a hazard due to direct toxic effects, but can present a small hazard due to radioactivity if tritium taken into the body. All appropriate precautions for the handling of radioactive materials should be followed if breakage of lights or devices occur; however, the design of these lights and devices are intended to ensure inherent safety even in the case of breakage.*

### Section 12: Ecological Information (non-mandatory)

As with any other radioactive material, avoid release of tritium gas to the environment if possible. In case of breakage, allow tritium gas to dissipate to atmosphere in order to minimize hazards.

### Section 13: Disposal Considerations (non-mandatory)

In Canada, tritium safety signs may be possessed, used, transferred and abandoned without a licence to carry on that activity, subject to the requirements of Section 7 of the *Nuclear Substances and Radiation Devices Regulations*. Otherwise, contact jurisdictional authorities for disposal requirements and guidance.

### Section 14: Transport Information (non-mandatory)

Class 7 – Radioactive Materials. UN shipping code dependent on quantity of tritium in packages. Consult specialist in the transportation of dangerous goods for further guidance.

### Section 15: Regulatory Information (non-mandatory)

This SDS was prepared in line with the requirements of the *Hazardous Products Act* and associated regulations; however, tritium-powered self-luminous safety lights and devices are WHMIS-Exempt products in Canada. Although nuclear substances such as tritium gas are exempt from the requirements of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS), this SDS is intended to convey safety information in a format that complies with the GHS for use in jurisdictions outside of Canada.

In Canada, the use of nuclear substances is regulated by the Canadian Nuclear Safety Commission, as per the *Nuclear Safety and Control Act* (website: <https://nuclearsafety.gc.ca>)

### Section 16: Other Information

**SDS date of preparation/update:** October 6, 2021