

Material Safety Data Sheet

LightGuard® Protected Membrane Roof Insulation

The LightGuard® Protected Membrane Roof Insulation (PMRI) is a composite of Styrofoam® RM brand extruded polystyrene foam thermal insulation with an attached coating of modified latex concrete. We will treat this MSDS as a two part document: (A) covering the extruded polystyrene foam thermal insulation, and (B) the concrete topping.

(A) Styrofoam RM Brand Extruded Polystyrene Thermal Insulation MSD: 002462

1. INGREDIENTS: (% W/W, Unless Otherwise Noted)

Polystyrene	CAS# 009003-53-6	73.5-100%
Chlorodifluoroethane	CAS# 000075-68-3	0-10%
Ethyl Chloride	CAS# 000075-00-3	0-4.5%
Polyethylene	CAS# 009002-88-4, or CAS# 026221-73-8	0-10%
Hexabromocyclododecane	CAS# 025637-99-4	0-2.0%

This document was prepared pursuant to the OSHA hazard communication standard (29 CFR 1910.1200). In addition, other substances not hazardous per this OSHA standard may be listed. Where proprietary ingredient shows, the identity may be made available as provided in this standard. This part of the document has been taken from MSDS information supplied to us from DOW Chemical U.S.A..

2. PHYSICAL DATA

Boiling Point: Not Applicable
Vap. Press: Not Applicable
Vap. Density: Not Applicable
Sol. in water: None
Sp. Gravity: 0.027 to 0.064
Appearance: Rigid Cellular Foam Board
Odor: No Odor

3. FIRE AND EXPLOSION HAZARD DATA:

Flash Point: 670° F, 354° C Flash Ignition Temperature
Method Used: ASTM D1929 Proc. B.
Flammable Limits: LFL: Not Applicable UFL: Not Applicable
Extinguishing Media: Water Spray.

Fire & Explosion Hazards: This polystyrene foam plastic product is combustible. This product contains a flame retardant to inhibit accidental ignition from small fire sources. However, once ignited this product will burn, emitting a dense black smoke. During shipping, storage, and use this product must be protected from flame or other high heat sources. During certain fabrication operations such as cutting and grinding, blowing agents or dust may be released. Accumulation of blowing agents or dust in air could present flammability and explosion concerns. Provide adequate ventilation, and appropriate dust handling systems where needed. This product should not be shipped, stored or used in virtually airtight spaces to prevent the build-up of combustible vapors.

Fire Fighting Equipment: Wear positive-pressure, self-contained breathing apparatus. Apply large volume of water directly on flame or burning surface.

4. REACTIVITY DATA:

Stability: Conditions To Avoid: Avoid fire and high temperatures. Temperatures over 300 \emptyset C (572 \emptyset F) will release combustible gases.

Incompatibility: Specific Materials to Avoid: Aromatic Hydrocarbons, Higher (>C5) Aliphatic Hydrocarbons, Esters, Amines, Higher Aldehydes.

Hazardous Decomposition Products: Does not normally decompose. In smoldering or flaming conditions, carbon monoxide, carbon dioxide, carbon are generated. Evolution of small amounts of hydrogen bromide, hydrogen chloride and hydrogen fluoride occur when burned or heated over 250 \emptyset C (482 \emptyset F); under high heat, non-flaming conditions, small amounts of aromatic hydrocarbons such as styrene and ethyl benzene are generated.

Studies have found that the products of combustion of this polystyrene foam insulation are no more acutely toxic than the products of combustion of other common building materials such as wood.

Hazardous Polymerization: Will not occur.

5. ENVIRONMENTAL AND DISPOSAL INFORMATION:

Action to take for Spills/Leaks: Pick up, or if dust or in small pieces, sweep up and place in suitable container for disposal.

Disposal Method: If conditions allow, this polystyrene foam plastic product may be reused or recycled where recycling programs and facilities exist. If reuse or recycling are not options, then incinerate in an approved waste-to-energy process with excess oxygen, or bury in an approved landfill. The disposal method must be in accordance with all local, state, and federal regulations.

6. HEALTH HAZARD DATA:

Eye: Solid or dust may cause irritation or corneal injury due to mechanical action.

Skin Contact: Skin absorption is unlikely due to the physical properties.

Ingestion: Ingestion is unlikely due to the physical state. Physical injury only. May cause choking if swallowed.

Inhalation: Dust may cause irritation to the upper respiratory tract. Excessive exposure to high concentrations of ethyl chloride, and chlorodifluoroethane blowing agents may cause central nervous system depression, anesthetic effects and irregular heartbeat (cardiac sensitization). In animals, excessive exposure to chlorodifluoroethane has caused low blood pressure, respiratory stimulation and tightness in the chest (bronchoconstriction). Concentrations of the above blowing agents anticipated incidental to proper handling are expected to be well below those which cause the acute inhalation effects listed above, as well as below OSHA PEL and DOW industrial hygiene guide. (See Section 8 for handling precautions)

Systemic (Other Target Organ) Effects: Repeated exposures to dusts of this material are not anticipated to result in systemic toxicity or permanent lung injury; however, excessive exposures may cause less severe respiratory effects. Hexabromocyclododecane (HBCD) may increase tissue levels of bromine.

Cancer Information: Neither polystyrene foam dust, nor chlorodifluoroethane caused cancer in long-term animal studies. An increase in uterine tumors has been reported in female mice exposed for their lifetimes to 15,000 ppm ethyl chloride. Such tumors did not occur in rats similarly exposed. These results are of unknown relevance to humans.

Teratology (Birth Defects): No birth defects were seen in animal studies with Ethyl Chloride or Chlorodifluoroethane.

Mutagenicity (Effects on Genetic Material): Results of tests for genetic effects with hexabromocyclododecane have been negative. Ethyl chloride and chlorodifluoroethane have been shown to be negative in some in vitro (test tube) mutagenicity tests and positive in others. Results of mutagenicity tests in animals on chlorodifluoroethane have been negative.

7. FIRST AID:

Eyes: No adverse effects anticipated by this route of exposure incidental to proper industrial handling.

Skin: Wash off in flowing water or shower.

Ingestion: No adverse effects anticipated by this route of exposure.

Inhalation: Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

Note to Physician: Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs unless absolutely necessary. No specific antidote. Supportive care. Treatment based on judgment of the physician in response to reactions of the patient.

8. HANDLING PRECAUTIONS:

Exposure Guideline(s): Ethyl Chloride: DOW Industrial Hygiene Guide (IHG) is 150 ppm; ACGIH TLV and OSHA PEL are 1000 ppm. DOW IGH for chlorodifluoroethane is 1000 ppm.

Ventilation: Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines.

Respiratory Protection: Atmospheric levels should be maintained below the exposure guideline. When respiratory protection is required for certain operations, including but not limited to saw, router, or hot wire cutting, use an approved air-purifying respirator. In dusty atmospheres, use an approved dust respirator.

Skin Protection: No precaution other than clean body-covering clothing should be needed.

Eye Protection: Use Safety Glasses. If there is potential for exposure to particles which could cause mechanical injury to the eye, wear chemical goggles.

9. ADDITIONAL INFORMATION:

Special Precautions to be taken in Handling and Storage: Limited industrial hygiene measurements of ethyl chloride in ventilated warehouses and production facilities indicate that ethyl chloride present in the air is below the current 150 ppm Industrial Hygiene Guide for ethyl chloride.

Gas fired recirculating air furnaces or heaters, gas water heaters, etc., drawing air from areas where there may be a presence of ethyl chloride, and chlorodifluoroethane gases from storage or fabrication of extruded polystyrene foam, can be subjected to rust and corrosion problems as a result of thermal decomposition of the blowing agents to hydrogen chloride.

Notice: This polystyrene foam plastic product is combustible and should be protected from flame and other heat sources. It should be installed with code-acceptable thermal barriers or used in approved alternative constructions. For more information, call DOW (1-800-441-4DOW).

MSDS Status: REVISED SECTIONS 3, 5, 7, 8, AND REGULATORY INFORMATION.

REGULATORY INFORMATION: (Not meant to be all-inclusive — selected regulations represented).

Notice: The information herein is presented in good faith and believed to be accurate as of the effective date of 10/14/92. However, No Warranty, expressed or implied, is given. Regulatory requirements are subject to change and may differ from one location to another; it is the buyer's responsibility to ensure that its activities comply to federal, state or provincial, and local laws. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See MSDS sheet for health and safety information.

US. REGULATIONS

SARA 313 Information: This product contains the following substances subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372:

Chemical Name	CAS Number	Conc.
CHLOROETHANE (Ethyl Chloride)	000075-00-3	< 4.5%

SARA Hazard Category: This product has been reviewed according to the EPA "Hazard Categories" promulgated under sections 311 and 312 of the Superfund Amendments and Reauthorization Act of 1986 (SARA Title III) and is considered, under applicable definitions, to meet the following categories.

EXEMPT ARTICLE

This product has been determined to be an article under the definition included in the OSHA Hazard Communication Standard (29 CFR 1910.1200).

CALIFORNIA PROPOSITION 65

The following statement is made in order to comply with the California Safe Drinking Water and Toxic Enforcement Act Of 1986. This product contains a chemical(s) known to the State of California to cause cancer. (See section 6 of the MSDS for details on carthogenicity.)

NATIONAL FIRE PROTECTION ASSOCIATION (NAPA) RATINGS

Health	0
Flammability	1
Reactivity	0

CANADIAN REGULATIONS

The workplace hazardous materials information system (W.H.M.I.S.) classification for this product is: This product isn't a "controlled product" under W.H.M.I.S..

The Transportation of Dangerous Goods Act (T.D.G.A.) Classification for this Product is: Not Regulated.

(B) MODIFIED LATEX CONCRETE TOPPING

1. IDENTITY

Product Name: Concrete Topping for LightGuard PMRI

The concrete topping on the LightGuard PMRI is a latex modified heavy weight concrete which is formed and extruded on the surface of the Styrofoam RM brand extruded polystyrene foam thermal insulation. After the concrete is allowed to cure, there are no serious hazards when utilized except those as noted below.

2. HAZARDOUS INGREDIENTS

Cement: 10 - 25% By Weight
Heavy Weight Aggregate: 60 - 80% By Weight
Latex (Styrene/butadiene polymer): <10% By Weight
H2O <10% By Weight

3. PHYSICAL & CHEMICAL CHARACTERISTICS

Boiling Point: N/A
Specific Gravity: N/A
Vapor Pressure: N/A
% Volatile: N/A
Vapor Density: N/A
Evaporation Rate: N/A
Appearance & Odor: A hard gray covering with a slight cement odor
Flash Point: N/A
Flammable Limits in Air: N/A
Extinguisher Type: WATER
Unusual Fire & Explosion Hazard: NONE

4. PHYSICAL HAZARDS

Stability: Stable
Incompatibility: Strong Acids
Materials to Avoid: Strong Acids
Hazardous Decomposition Products: Gases from Strong Acid Degradation

5. TOXICOLOGICAL PROPERTIES

Medical Conditions Generally

Aggravated by Exposure Protection: Possible abrasion by handling without proper protection

Route of Entry: Inhalation or eye contact

Acute Exposure: Possible irritation of nose, throat and lungs from excessive exposure to dust

Chronic Exposure: Chronic overexposure to dust containing Silica (Quartz Cristobalite and Tridymite) can cause delayed lung injury (Silicosis). Inhalation of Crystalline silica may contribute to pre-existing Pulmonary diseases such as Asthma and Lung Disorders associated with the smoking of tobacco. Some recent animal studies have caused the International Agency (1) There is sufficient evidence for the Carcinogenicity to experimental animals. (2) There is limited evidence for the Carcinogenicity to humans.

Toxicity Data:**Quartz:** LCLO-300 ug/m³/IDY-1 Inhalation Human**Crystobalite:** TCLO-16 mppcf/8H/17.9Y- 1 Inhalation Human**Tridymite:** TCLO-16 mppcf/8H/17.9Y-1 Inhalation Human**Note:** LD 50 and LC 50 are not available

In contradiction to IARC's listing as a Class 2A Carcinogen. There is considerable disagreement by an informed scientific body (i.e. "Literature Survey of the Evidence Concerning the Carcinogenicity of Crystalline Silica" by Dr. Karen Hagelstein of Stefan, Robertson and Kristen, consulting Engineers, 1412 140th Place NE, Bellview, WA 98007).

6. SPECIAL PROTECTION INFORMATION**Respiratory Protection NIOSH:** Dust may cause irritation to respiratory tract. Use NIOSH approved dust masks**Ventilation:** General of local to control airborne levels**Protective Gloves:** In damp conditions, abrasion and skin irritation due to the alkali in the cement**Eye Protection:** Use safety glasses with shields while cutting**Other Protective Clothing****or Equipment:** Possible use for aprons**First Aid Measures:** Wash thoroughly with soap and water. If irritation remains, see medical attention**7. DOCUMENTARY INFORMATION**

The information presented here is based on the testing data available to us at the time of publication and is believed to be correct. Since this information may have been obtained in part from independent laboratories or other sources not under our direct supervision, no representation is made that the information is accurate, reliable, complete or representative. We have made no effort to conceal nor to censor deleterious aspects of this product. Since we cannot anticipate all conditions which may arise during use of this product, we make no guarantee that the health and safety precautions for all individuals and/or situations involving its handling and use.

Likewise, we make no guarantee or warranty of any kind that the use or disposal of this product is in compliance with all federal, state, or local laws. It is the obligation of the user of the product herein to determine and comply with the requirements on all applicable statutes.