

T. CLEAR LIGHTGUARD[®]
BALLASTED ROOF INSULATION
MATERIAL SAFETY DATA SHEET

The LIGHTGUARD[®] BALLASTED ROOF INSULATION 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 covering: (A) the extruded polystyrene foam thermal insulation, and (B) the concrete topping.

(A) STYROFOAM[®] RM BRAND EXTRUDED POLYSTYRENE THERMAL INSULATION

1. Product and Company Identification

Product Name: STYROFOAM[®] ROOFMATE[®], 24 x 96 inch Extruded Foam Roof Insulation

Manufacturer: The Dow Chemical Company, Midland, MI 48674 (800-258-2436)
 Emergency Phone: 989-636-4400

2. Composition/Information on Ingredients:

<u>Chemical Name</u>	<u>CASRN</u>	<u>Concentration</u>
Styrene, polymers	9003-53-6	>=0.0 - <=10%
1,1,1,2-Tetrafluoroethane	811-97-2	>=5.0 - <=10%
2-Propenenitrile, polymer with ethenylbenzene Hologenated flame retardant	9003-54-7	>=60.0 - <=100%

This document was prepared pursuant to the OSHA hazard communication standard (29 CFR 1910.1200(g)). 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 The Dow Chemical Company.

3. Physical and Chemical Properties:

Boiling PointNot Applicable
 Vapor Pressure.....Not Applicable
 Vapor DensityNot Applicable
 Solubility in waterNone
 Specific Gravity/Density.....0.027 to 0.064
 Appearance.....Blue Rigid Cellular Foam Board
 OdorNo Odor

4. Fire and Explosion Hazard Data:

Flash Point670°F/354°C Flash Ignition Temperature
 Method UsedASTM D1929 Proc. B.
 Flammable Limits LFL.....Not Applicable
 Flammable Limits UFL.....Not Applicable
 Extinguishing MediaFoam, Water, Carbon Dioxide, Dry Chemical
 Melting Point90 - 130°C (194-266°F) Estimated

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4. Fire and Explosion Hazard Data (continued):

Hazardous Combustion Products: In smoldering or flaming conditions, carbon monoxide, carbon dioxide and carbon are generated. Evolution of small amounts of hydrogen halides occurs when burned or heated above 250°C (480°F). Under fire conditions polymers decompose. The smoke may contain polymer fragments of varying compositions in addition to unidentified and/or irritating compounds. Studies have shown that the products of combustion of this foam are not more acutely toxic than the products of combustion of common building materials, such as wood.

Fire-fighting Instructions: Keep people away. Isolate fire area and deny unnecessary entry. If material is molten, do not apply direct water stream. Use fine water spray or foam. Soak thoroughly with water to cool and prevent re-ignition. Cool surroundings with water to localize fire zone.

Protective Fire-fighting Equipment: Wear positive-pressure, self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, pants, boots and gloves). If protective equipment is not available or not used, fight fire from protected location or safe distance.

5. Reactivity Data:

Stability: Thermally stable at typical use temperatures.

Conditions To Avoid - Avoid direct sunlight. Maximum use temperature is 73°C (165°F). Avoid temperatures over 300°C (572°F). Product can decompose at elevated temperatures.

Incompatibility with Other Materials: Avoid contact with oxidizing materials. Avoid contact with aldehydes, amines, esters, liquid fuels, and organic solvents.

Hazardous Decomposition Products: Does not normally decompose. Evolution of small amounts of hydrogen halides occurs when heated above 250°C. Under high heat, non-flaming conditions, small amounts of aromatic hydrocarbons such as styrene and ethylbenzene are generated. Hazardous decomposition products depend upon temperature, air supply and the presence of other materials. Hazardous decomposition products may include and are not limited to ethylbenzene, aromatic compounds, aldehydes, hydrogen bromide, hydrogen chloride, hydrogen fluoride, polymer fragments, and styrene.

Hazardous Polymerization: Will not occur.

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6. Health Hazard Data:

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

Skin Contact: Essentially nonirritating to skin. Mechanical injury only. Skin absorption is unlikely due to the physical properties.

Ingestion: Single dose oral toxicity is considered to be low. Small amounts swallowed incidental to normal handling operations are not likely to cause injury; swallowing amounts larger than that may cause injury. May cause choking or blockage of the digestive tract if swallowed.

Inhalation: Dust may cause irritation to the upper respiratory tract (nose and throat). Vapors/fumes released during thermal operations such as hot wire cutting may cause eye and respiratory irritation. Concentrations of the blowing agents anticipated incidental to proper handling are expected to be well below those which cause acute inhalation effects and below exposure guidelines. The LC50 has not been determined.

Systemic (Other Target Organ) Effects: Based on available data, repeated exposures to dusts of this material are not anticipated to cause significant adverse effects.

Cancer Information: Contains component(s) which did not cause cancer in long-term animal studies.

Teratology (Birth Defects): Contains component(s) which did not cause birth defects in laboratory animals. The component(s) is/are 1,1,1,2-Tetrafluoroethane.

Reproductive Effects: No relevant information found.

7. First Aid:

Eyes: Flush eyes with plenty of water; mechanical effects only.

Skin: Wash off in flowing water or shower.

Ingestion: If swallowed, seek medical attention. May cause gastrointestinal blockage. Do not give laxatives. Do not induce vomiting unless directed to do so by medical personnel.

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

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8. Handling and Storage:

Handling: Maintain good housekeeping. Layers of flammable dusts should not be permitted to accumulate. See Section 10, Exposure Controls/Personal Protection.

WARNING: In order to prevent buildup of combustible vapors, do not store large quantities of this product in unventilated spaces. Transport bulk shipments of this product in ventilated vehicles.

Storage: Flammable vapors may accumulate in some storage situations. Storage, use and handling areas should be "No Smoking" areas. See Section 10, Exposure Controls/Personal Protection.

Minimize sources of ignition, such as static buildup, heat, spark or flame.

When storing or fabricating large quantities of extruded polystyrene foam, the blowing agents (i.e. 1,1,1,2-Tetrafluoroethane.) released from the foam, if any, may thermally decompose to hydrogen chloride, which tends to accelerate corrosion or rust development of heaters, boilers, gas fired recirculating air furnaces or heaters, or gas water heaters.

This polystyrene foam plastic product is combustible and should be protected from flame and other high heat sources. It should be installed with code-acceptable thermal barriers or used in approved alternative constructions.

9. Accidental Release Measures: (See Section 15 for Regulatory Information):

Protect People: Clear non-emergency personnel from area. Use appropriate safety equipment. For additional information, refer to Section 10, Exposure Controls/Personal Protection.

Protect the Environment: Firewater run off may be toxic.

Cleanup: Pick up, or if dust or in small pieces, sweep up and place in suitable container for disposal. See Section 13, Disposal Considerations.

10. Exposure Controls/Personal Protection:

Engineering Controls: 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.

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

Exposure Guideline(s): 1,1,1,2-Tetrafluoroethane: AIHA WEEL is 1000 ppm, TWA.

11. **Toxicological Information:** (See Section 6 for Health Hazard Data. For detailed toxicological data, write or call The Dow Chemical Company)

Mutagenicity (Effects on Genetic Material): For the minor component(s) 1,1,1,2-Tetrafluoroethane., in vitro mutagenicity studies were negative in some cases and positive in other cases. Animal mutagenicity studies were negative.

12. **Ecological Information:**

Ecotoxicological information on this product or its components appear in this section when such data is available.

Toxicity

Acute toxicity to fish

Not expected to be acutely toxic to aquatic organisms.

Persistence and degradability

Biodegradability: Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Mobility in soil

In the terrestrial environment, material is expected to remain in the soil.

In the aquatic environment, material is expected to float.

13. **Disposal Considerations:** (See Section 15 for Regulatory Information)

Disposal: All disposal methods must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator.

For unused & uncontaminated product, the preferred options include sending to a licensed, permitted: recycler, re-claimer, incinerator or other thermal destruction device, landfill.

For additional information, refer to Section 8, Handling & Storage Information.

The Dow Chemical Company can provide names of information resources to help identify waste management companies and other facilities, which recycle, reprocess or manage chemicals or plastics, and that manage used

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drums. Call Dow Customer Information at 800-258-2436 or 989-832-1556 for further details.

14. Transportation Information:

Department of Transportation (DOT): This product is not regulated by the DOT when shipped domestically by land.

Canadian TDG Information: This product is not regulated by the TDG when shipped domestically by land.

15. Regulatory Information: (Not meant to be all-inclusive - selected regulations represented)

NOTICE: The information contained herein is based on data considered to be accurate. 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 with Federal, State/Provincial, and local laws. While the information is believed to be reliable, NO Warranty, expressed or implied, is given in regards to the accuracy of this data or the results to be obtained from the use thereof. Since the use of this information and the conditions and use of this product are controlled by the user, it is the user's obligation to determine the conditions of safe use of the product. The following specific information is made for the purpose of complying with numerous federal, state or provincial, and local laws and regulations. See other sections for health and safety information.

OSHA Hazard Communication Standard

-This product is not a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

**Superfund Amendments and Reauthorization Act of 1986 Title III
(Emergency Planning and Community Right-to-Know Act of 1986) Sections
311 and 312**

-This product is not a hazardous chemical under 29CFR 1910.1200, and therefore is not covered by Title III of SARA.

**Superfund Amendments and Reauthorization Act of 1986 Title III
(Emergency Planning and Community Right-to-Know Act of 1986) Section
313**

-This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Pennsylvania Worker and Community Right-To-Know Act:

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-To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

-This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

United States TSCA Inventory (TSCA)

-The product meets the definition of an article and is exempt from inventory requirements.

Canadian Regulations

WHMIS Information: The Canadian Workplace Hazardous Materials Information System (WHMIS) Classification for this product is:

This Product is not a "Controlled Product" under WHMIS.

Canadian Environmental Protection Act (CEPA): All substances in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information:

National Fire Protection Association (NFPA) Ratings:

Health..... 1
Flammability..... 1
Reactivity..... 0

(B) MODIFIED LATEX CONCRETE TOPPING

1. Identity

Product Name: Concrete topping for LIGHTGUARD[®] Ballasted Roof Insulation

The concrete topping on the LIGHTGUARD Ballasted Roof Insulation 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.

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2. Hazardous Ingredients

Cement.....	10 - 25% by weight
Heavyweight Aggregate	60 - 80% by weight
Latex (Styrene/butadiene polymer).....	<10% by weight
Water	<10% by weight

3. Physical & Chemical Characteristics

Boiling Point	Not Applicable
Specific Gravity	Not Applicable
Vapor Pressure.....	Not Applicable
% Volatile	Not Applicable
Vapor Density	Not Applicable
Evaporation Rate	Not Applicable
Appearance & Odor.....	A hard gray covering with a slight cement odor
Flash Point	Not Applicable
Flammable Limits in Air	Not Applicable
Extinguisher Type	Water
Unusual Fire & Explosion Hazards.....	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	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 to conclude: (1) there is sufficient evidence for carcinogenicity to experimental animals; (2) there is limited evidence for the carcinogenicity to humans.

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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, Bellevue, Washington 98007.

6. Special Protection Information

Respiratory

Protection..... Dust may cause irritation to respiratory tract, use NIOSH approved dust masks.

Ventilation..... General or 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, seek 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 it's handling and use. Likewise, we make no guaranty 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.