T. CLEAR LIGHT**GUARD**®
BALLASTED ROOF INSULATION
MATERIAL SAFETY DATA SHEET

The LIGHT**GUARD**® 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® 2.00 x 24 inch Extruded Foam Roof Insulation (Product Code: 39067, MSD: 006839)

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

2. Composition/Information on Ingredients:

Chemical Name	CAS Number
Polystyrene	009003-53-6
1-Chloro-1, 1-difluoroethane	000075-68-3
Copolymer mixtures	not available
Talc	014807-96-6
Magnesium oxide	001309-48-4
Halogenated flame retardant	not available

This product may contain additives (such as magnesium silicate, CAS # 14807-96-6) generally at levels <1.5% maximum.

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 The Dow Chemical Company.

3. Physical and Chemical Properties:

Boiling Point .....Not Applicable
Vapor Pressure.....Not Applicable
Vapor Density .....Not Applicable
Solubility in water .....None
Specific Gravity/Density.....0.027 to 0.064 estimated
Appearance.....Blue Rigid Cellular Foam Board
Odor .....No Odor
Melting Point .....90-130˚C (194-266˚F) estimated

4. 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
Flammable Limits UFL .....Not Applicable
Extinguishing Media .....Foam, Water, Carbon Dioxide, Dry Chemical

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 a 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.

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. High concentrations of the blowing agents (>5000 ppm) may cause central nervous system, anesthetic or narcotic effects and cardiac sensitization (irregular heartbeats). Concentrations of the blowing agents anticipated incidental to proper handling are expected to be well below guidelines. In animals, excessive exposure to chlorodifluoroethane (HCFC-142b) has caused low blood pressure, respiratory stimulation and chest tightness (bronchial constriction).

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: Neither polystyrene foam dust, nor chloro-difluoroethane (HCFC-142b) caused 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 dichlorofluoroethane (HCFC-142b).

Reproductive Effects: No relevant information found.

Mutagenicity (Effects on Genetic Material): For the minor component(s) dichlorofluoroethane (HCFC-142b), in vitro mutagenicity studies were negative in some cases and positive in other cases. Animal mutagenicity studies were negative.

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.

8. Handling and Storage:

Handling: Maintain good housekeeping. Layers of flammable dusts should not be permitted to accumulate. See Section 9, 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 9, 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. chlorodifluoroethane) 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 13 for Regulatory Information)**:**

Protect People: Clear non-emergency personnel from area. Use appropriate safety equipment. For additional information, refer to Section 9, 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 11, 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.

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-Chloro-1, 1-difluoroethane (HCFC-142b): AIHA WEEL is 1000 ppm, TWA.

11. Ecological Information:

Movement & Partitioning: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000). In the terrestrial environment, material is expected to remain in the soil. In the aquatic environment, material is expected to float. Based largely or completely on information for flame retardant. There is no evidence of any significant leaching. Therefore, it is unlikely to contaminate groundwater.

Degradation & Persistence: Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected. Based largely or completely on information for blowing agent. Chlorodifluoroethane (HCFC-142b) remains in the foam and diffuses out slowly, most of it degrading in the troposphere to CO_2, HCl, and HF. Chlorodifluoroethane (HCFC-142b) has a stratospheric ozone depletion potential (ODP) of 0.065, relative to CFC 12 (ODP=1).

Ecotoxicity: Not expected to be acutely toxic.

12. Disposal Considerations (See Section 13 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 7, 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 drums. Call Dow Customer Information at 800-258-2436 or 989-832-1556 for further details.

13. 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.

14. 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 review date of 01/13/04. 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 with Federal, State/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 other sections for health and safety information.

U.S. 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	Concentration
Chlorodifluoroethane	000075-00-3	< 15%

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:

Not to have met any hazard category.

State Right-to-Know: The following product components are cited on certain state lists as mentioned. Non-listed components may be shown in the composition section of the MSDS.

Chemical Name	CAS Number	List
Chlorodifluoroethane	000075-00-3	NJ2 PA1 NJ3
Talc	014807-96-6	PA1 NJ3

NJ2=New Jersey Environmental Hazardous Substance (present at greater than or equal to 1.0%)

NJ3=New Jersey Workplace Hazardous Substance (present at greater than or equal to 1.0%)

PA1=Pennsylvania Hazardous Substance (present at greater than or equal to 1.0%)

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

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.

15. Other Information

National Fire Protection Association (NFPA) Ratings

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

(B) MODIFIED LATEX CONCRETE TOPPING

1. Identity

Product Name: Concrete topping for LIGHT**GUARD**® Ballasted Roof Insulation

The concrete topping on the LIGHT**GUARD** 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.

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.

Toxicity Data:
Quartz: LCLO - 300 ug/m^3/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, Belleview, 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.