



Material Safety Data Sheet

The Dow Chemical Company

Product Name: TUFF-R(TM) 1.00 Inch Insulation Sheathing

Issue Date: 08/05/2013

Print Date: 06 Aug 2013

The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

TUFF-R(TM) 1.00 Inch Insulation Sheathing

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
United States

Customer Information Number:

800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact:

989-636-4400

Local Emergency Contact:

989-636-4400

2. Hazards Identification

Emergency Overview

Color: Tan

Physical State: Board

Odor: Mild

Hazards of product:

Toxic fumes may be released in fire situations.

OSHA Hazard Communication Standard

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

Potential Health Effects

Eye Contact: Solid or dust may cause irritation or corneal injury due to mechanical action. Fumes or dust generated from cutting or grinding operations may cause eye irritation.

Skin Contact: May cause skin irritation due to mechanical abrasion.

Skin Absorption: Skin absorption is unlikely due to physical properties.

Inhalation: Dusts or fibers generated in processing may cause irritation of the upper respiratory tract (nose and throat). Fumes or dusts generated from cutting or grinding operations may cause irritation

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of the upper respiratory tract and lungs. 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.

Ingestion: Swallowing is unlikely because of the physical state. Very low toxicity if swallowed.

Harmful effects not anticipated from swallowing small amounts. May cause choking if swallowed.

Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

Effects of Repeated Exposure: 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. The data presented are for the following material: The fiberglass in this product is continuous filament fiberglass. Repeated exposure to particles generated by grinding may result in implantation of particles in the skin.

3. Composition Information

Component	CAS #	Amount
Modified Polyisocyanurate Rigid Cellular Polymer	Not applicable	> 60.0 %
Aluminum	7429-90-5	< 20.0 %
Kraft Paper	Not applicable	< 15.0 %
Hydrocarbon blowing agent(s)	Trade secret	< 10.0 %
Continuous Filament Glass Fiber	Not applicable	< 10.0 %
Polyethylene terephthalate (PET)	25038-59-9	< 10.0 %
Poly(ethylene oxide)	25322-68-3	< 5.0 %
Tris(1-chloro-2-propyl) phosphate	13674-84-5	< 5.0 %

4. First-aid measures

Description of first aid measures

General advice: If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin Contact: Wash skin with plenty of water.

Eye Contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

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.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote.

Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Suitable extinguishing media

Water. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. In smoldering or flaming conditions, carbon monoxide, carbon dioxide and carbon are generated. Combustion products may include and are not limited to: Nitrogen oxides. Combustion products may include trace amounts of: Hydrogen cyanide. Hydrogen halides.

Unusual Fire and Explosion Hazards: Container may vent and/or rupture due to fire. When product is stored in closed containers, a flammable atmosphere can develop. Mechanical cutting, grinding, crushing or sawing can cause formation of dusts. To reduce the potential for dust explosion, do not permit dust to accumulate. This product contains a flame retardant to inhibit accidental ignition from small fire sources. This plastic foam product is combustible and should be protected from flames and other high heat sources. For more information, contact Dow. Dense smoke is emitted when burned without sufficient oxygen.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. Cool surroundings with water to localize fire zone.

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

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: This material is combustible and should not be exposed to flame or other ignition sources. No smoking, open flames or sources of ignition in handling and storage area. Fabrication methods which involve cutting into this product may release the blowing agent(s) remaining in the cells. Provide adequate ventilation to assure localized concentrations in release areas are maintained below the lower flammable limit. Refer to Exposure Controls and Personal Protection, Section 8 of the MSDS.

Other Precautions: Good housekeeping and controlling of dusts are necessary for safe handling of product.

Storage

Minimize sources of ignition, such as static build-up, heat, spark or flame. Flammable vapors may accumulate in some storage situations. During shipment, storage, installation and use, this material should not be exposed to flame or other ignition sources.

8. Exposure Controls / Personal Protection

Exposure Limits

Component	List	Type	Value
Aluminum	OSHA Table Z-1	PEL Total dust. as Al	15 mg/m ³
	OSHA Table Z-1	PEL Respirable dust. as Al	5 mg/m ³
	ACGIH	TWA Respirable fraction.	1 mg/m ³
Continuous Filament Glass Fiber	ACGIH	TWA Inhalable fraction.	5 mg/m ³
	ACGIH	TWA Fiber.	fibers/cm ³
Cyclopentane (8CI, 9CI)	ACGIH	TWA	600 ppm
Isopentane	ACGIH	TWA	600 ppm
Poly(ethylene oxide)	AIHA WEEL	TWA Particulate.	10 mg/m ³

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.

Personal Protection

Eye/Face Protection: Eye protection should not be necessary. For fabrication operations safety glasses (with side shields) are recommended. If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles.

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

Hand protection: Use gloves to protect from mechanical injury. Selection of gloves will depend on the task.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. If respiratory irritation is experienced, use an approved air-purifying respirator. The following should be effective types of air-purifying respirators: Particulate filter.

Ingestion: No precautions necessary due to the physical properties of the material.

Engineering Controls

Ventilation: Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance

Physical State	Board
Color	Tan
Odor	Mild
Odor Threshold	No test data available
pH	Not applicable
Melting Point	> 150 °C (> 302 °F) Decomposes
Freezing Point	Not applicable
Boiling Point (760 mmHg)	Not applicable.

Flash Point - Closed Cup	Not applicable
Evaporation Rate (Butyl Acetate = 1)	No test data available
Flammability (solid, gas)	No data available
Flammable Limits In Air	Lower: Not applicable Upper: Not applicable
Vapor Pressure	Not applicable
Vapor Density (air = 1)	Not applicable
Specific Gravity (H2O = 1)	0.02 - 0.05 <i>Estimated.</i>
Solubility in water (by weight)	insoluble in water
Autoignition Temperature	490 °C (914 °F) <i>ASTM D1929</i>
Decomposition Temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular Weight	No test data available

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

Thermally stable at typical use temperatures.

Possibility of hazardous reactions

Polymerization will not occur.

Conditions to Avoid: Avoid temperatures above 150°C (302°F) Exposure to elevated temperatures can cause product to decompose. Avoid direct sunlight.

Incompatible Materials: Avoid contact with: Strong oxidizers.

Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Toxic gases are released during decomposition.

11. Toxicological Information

Acute Toxicity

Ingestion

As product: Single dose oral LD50 has not been determined.

Dermal

As product: The dermal LD50 has not been determined.

Inhalation

As product: The LC50 has not been determined.

Eye damage/eye irritation

Solid or dust may cause irritation or corneal injury due to mechanical action. Fumes or dust generated from cutting or grinding operations may cause eye irritation.

Skin corrosion/irritation

May cause skin irritation due to mechanical abrasion.

Sensitization

Skin

No relevant data found.

Respiratory

|| No relevant data found.

Repeated Dose Toxicity

|| 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. The data presented are for the following material: The fiberglass in this product is continuous filament fiberglass. Repeated exposure to particles generated by grinding may result in implantation of particles in the skin. Additives are encapsulated in the product and are not expected to be released under normal processing conditions or foreseeable emergency.

Chronic Toxicity and Carcinogenicity

|| The fiberglass in this product is continuous filament fiberglass. IARC's evaluation of data on continuous filament fiberglass is that there is inadequate evidence of carcinogenicity in animals and in humans. IARC's classification was based primarily on animal studies involving routes of administration (intratracheal, intrapleural, and intraperitoneal) which have limited relevance to typical exposures anticipated in industrial settings.

Developmental Toxicity

|| No relevant data found.

Reproductive Toxicity

|| No relevant data found.

Genetic Toxicology

|| The data presented are for the following material: The fiberglass in this product is continuous filament fiberglass. In vitro genetic toxicity studies were inconclusive.

12. Ecological Information

Toxicity

|| Not expected to be acutely toxic to aquatic organisms.

Persistence and Degradability

|| 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

|| **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

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices 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. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED

PRODUCT, the preferred options include sending to a licensed, permitted: Landfill. Incinerator or other thermal destruction device.

14. Transport Information

DOT Non-Bulk
NOT REGULATED

DOT Bulk
NOT REGULATED

IMDG
NOT REGULATED

ICAO/IATA
NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. Regulatory 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

Immediate (Acute) Health Hazard	No
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	No
Sudden Release of Pressure Hazard	No

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

This product contains the following substances which are subject to the reporting requirements of Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and which are listed in 40 CFR 372.

Component	CAS #	Amount
Aluminum	7429-90-5	< 20.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Aluminum	7429-90-5	< 20.0 %
Hydrocarbon blowing agent(s)	Trade secret	< 10.0 %

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

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.

Toxic Substances Control Act (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

CEPA - Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. Other Information

Product Literature

Additional information on this product may be obtained by calling your sales or customer service contact. Ask for a product handling guide.

Recommended Uses and Restrictions**Identified uses**

Thermal insulation. For industrial use. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Revision

Identification Number: 51781 / 0000 / Issue Date 08/05/2013 / Version: 6.0

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

N/A	Not available
W/W	Weight/Weight
OEL	Occupational Exposure Limit
STEL	Short Term Exposure Limit
TWA	Time Weighted Average
ACGIH	American Conference of Governmental Industrial Hygienists, Inc.
DOW IHG	Dow Industrial Hygiene Guideline
WEEL	Workplace Environmental Exposure Level
HAZ_DES	Hazard Designation
Action Level	A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded.

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.