



Safety Data Sheet

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SECTION 1: Identification

1.1. Product identifier

3M™ 2-Component Industrial Rigid Froth Foam FRF-160, Part A, Cylinder

Product Identification Numbers

62-4835-8150-0, 62-4835-8300-1, 62-4835-8600-4

1.2. Recommended use and restrictions on use

Recommended use

Diisocyanate, Industrial use

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Industrial Adhesives and Tapes Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number

1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification

Acute Toxicity (inhalation): Category 4.
Serious Eye Damage/Irritation: Category 2A.
Skin Corrosion/Irritation: Category 2.
Respiratory Sensitizer: Category 1.
Skin Sensitizer: Category 1.
Specific Target Organ Toxicity (single exposure): Category 2.
Specific Target Organ Toxicity (respiratory irritation): Category 3.
Specific Target Organ Toxicity (repeated exposure): Category 1.

2.2. Label elements

Signal word

Danger

Symbols

Exclamation mark | Health Hazard |

Pictograms



Hazard Statements

Causes serious eye irritation.
Causes skin irritation.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
Harmful if inhaled.
May cause respiratory irritation.

May cause damage to organs:
cardiovascular system |

Causes damage to organs through prolonged or repeated exposure:
respiratory system |

Precautionary Statements

Prevention:

Do not breathe dust/fume/gas/mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
In case of inadequate ventilation wear respiratory protection.
Wear protective gloves and eye/face protection.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.

Response:

IF INHALED: Remove person to fresh air and keep comfortable for breathing.
If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.
IF ON SKIN: Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash it before reuse.
IF exposed or concerned: Call a POISON CENTER or doctor/physician.
Specific treatment (see Notes to Physician on this label).

Storage:

Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal:

Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

Notes to Physician:

Exposure may increase myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

2.3. Hazards not otherwise classified

Persons previously sensitized to isocyanates may develop a cross-sensitization reaction to other isocyanates.

2% of the mixture consists of ingredients of unknown acute oral toxicity.

2% of the mixture consists of ingredients of unknown acute inhalation toxicity.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Polymeric Diphenylmethane Diisocyanate	9016-87-9	60 - 100 Trade Secret *
1,1,1,2-Tetrafluoroethane	811-97-2	5 - 10 Trade Secret *
Diphenylmethane-2,4'-Diisocyanate	5873-54-1	0.5 - 5 Trade Secret *
4,4' -Diphenylmethane Diisocyanate	101-68-8	30 - 45 Trade Secret *
Non-Hazardous Components	Trade Secret*	1 - 5 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:

Remove person to fresh air. Get medical attention.

Skin Contact:

Immediately wash with soap and water. Remove contaminated clothing and wash before reuse. If signs/symptoms develop, get medical attention.

Eye Contact:

Immediately flush with large amounts of water. Remove contact lenses if easy to do. Continue rinsing. Get medical attention.

If Swallowed:

Rinse mouth. If you feel unwell, get medical attention.

4.2. Most important symptoms and effects, both acute and delayed

See Section 11.1. Information on toxicological effects.

4.3. Indication of any immediate medical attention and special treatment required

Exposure may increase myocardial irritability. Do not administer sympathomimetic drugs unless absolutely necessary.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media

DO NOT USE WATER In case of fire: Use a carbon dioxide or dry chemical extinguisher to extinguish.

5.2. Special hazards arising from the substance or mixture

Closed containers exposed to heat from fire may build pressure and explode.

Hazardous Decomposition or By-Products

Substance

Carbon monoxide
Carbon dioxide

Condition

During Combustion
During Combustion

Hydrogen Cyanide
Oxides of Nitrogen

During Combustion
During Combustion

5.3. Special protective actions for fire-fighters

No special protective actions for fire-fighters are anticipated.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions

Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up

Contain spill. Pour isocyanate decontaminant solution (90% water, 8% concentrated ammonia, 2% detergent) on spill and allow to react for 10 minutes. Or pour water on spill and allow to react for more than 30 minutes. Cover with absorbent material. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a container approved for transportation by appropriate authorities, but do not seal the container for 48 hours to avoid pressure build-up. Clean up residue with an appropriate solvent selected by a qualified and authorized person. Ventilate the area with fresh air. Read and follow safety precautions on the solvent label and SDS. Dispose of collected material as soon as possible.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Contaminated work clothing should not be allowed out of the workplace. Avoid release to the environment. Wash contaminated clothing before reuse. Keep away from reactive metals (eg. Aluminum, zinc etc.) to avoid the formation of hydrogen gas that could create an explosion hazard.

7.2. Conditions for safe storage including any incompatibilities

Store in a well-ventilated place. Keep container tightly closed to prevent contamination with water or air. If contamination is suspected, do not reseal container. Store away from heat. Store away from strong bases. Store away from amines.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
4,4' -Diphenylmethane Diisocyanate	101-68-8	ACGIH	TWA:0.005 ppm	
4,4' -Diphenylmethane Diisocyanate	101-68-8	OSHA	CEIL:0.2 mg/m ³ (0.02 ppm)	
FREE ISOCYANATES	101-68-8	Manufacturer determined	TWA:0.005 ppm;STEL:0.02 ppm	

FREE ISOCYANATES	5873-54-1	Manufacturer determined	TWA:0.005 ppm;STEL:0.02 ppm	
1,1,1,2-Tetrafluoroethane	811-97-2	AIHA	TWA:4240 mg/m3(1000 ppm)	
Benzene, 1,1'-methylenebis[4-isocyanato-	9016-87-9	ACGIH	TWA:0.005 ppm	
Benzene, 1,1'-methylenebis[4-isocyanato-	9016-87-9	OSHA	CEIL:0.2 mg/m3(0.02 ppm)	
FREE ISOCYANATES	9016-87-9	Manufacturer determined	TWA:0.005 ppm;STEL:0.02 ppm	

ACGIH : American Conference of Governmental Industrial Hygienists

AIHA : American Industrial Hygiene Association

CMRG : Chemical Manufacturer's Recommended Guidelines

OSHA : United States Department of Labor - Occupational Safety and Health Administration

TWA: Time-Weighted-Average

STEL: Short Term Exposure Limit

CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls

Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:

Full Face Shield

Indirect Vented Goggles

Skin/hand protection

Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing.

Gloves made from the following material(s) are recommended: Neoprene

Nitrile Rubber

Natural Rubber

If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - Neoprene

Apron – Nitrile

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:

Half facepiece or full facepiece air-purifying respirator suitable for organic vapors and particulates

Half facepiece or full facepiece supplied-air respirator

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

General Physical Form:	Liquid
Odor, Color, Grade:	Brown Slight musty odor
Odor threshold	No Data Available
Boiling Point	< 0 °F
Flash Point	425 °F
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	No Data Available
Flammable Limits(UEL)	No Data Available
Vapor Pressure	<=166 psi [@ 25 °C]
Vapor Density	>=3.03 g/cm3 [@ 25 °C] [Ref Std: AIR=1]
Density	1.23 g/ml
Specific Gravity	1.23 [@ 25 °C] [Ref Std: WATER=1]
Solubility in Water	Nil [Details: Reacts slowly with water to liberate CO2 gas.]
Solubility- non-water	No Data Available
Autoignition temperature	No Data Available
Decomposition temperature	No Data Available
Viscosity	130 centipoise [@ 25 °C]
Hazardous Air Pollutants	30 - 45 % weight
VOC Less H2O & Exempt Solvents	<=19 g/l [Test Method: calculated SCAQMD rule 443.1] [Details: when mixed as intended with Part B]
VOC Less H2O & Exempt Solvents	0 g/l [Test Method: calculated SCAQMD rule 443.1] [Details: as supplied]

SECTION 10: Stability and reactivity

10.1. Reactivity

This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability

Stable.

10.3. Possibility of hazardous reactions

Hazardous polymerization may occur. May occur if in contact with moisture or other materials which react with isocyanates. May occur at temperatures over 400F (204C) may cause polymerization.

10.4. Conditions to avoid

Heat
Light

10.5. Incompatible materials

Water
Amines
Strong bases
Aluminum
Alcohols

10.6. Hazardous decomposition products

<u>Substance</u>	<u>Condition</u>
None known.	

Refer to section 5.2 for hazardous decomposition products during combustion.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:

Harmful if inhaled.

Respiratory Tract Irritation: Signs/symptoms may include cough, sneezing, nasal discharge, headache, hoarseness, and nose and throat pain.

Allergic Respiratory Reaction: Signs/symptoms may include difficulty breathing, wheezing, cough, and tightness of chest.

May cause additional health effects (see below).

Skin Contact:

Skin Irritation: Signs/symptoms may include localized redness, swelling, itching, dryness, cracking, blistering, and pain.

Allergic Skin Reaction (non-photo induced): Signs/symptoms may include redness, swelling, blistering, and itching.

Eye Contact:

Severe Eye Irritation: Signs/symptoms may include significant redness, swelling, pain, tearing, cloudy appearance of the cornea, and impaired vision.

Ingestion:

Gastrointestinal Irritation: Signs/symptoms may include abdominal pain, stomach upset, nausea, vomiting and diarrhea.

Additional Health Effects:

Single exposure may cause target organ effects:

Cardiac Sensitization: Signs/symptoms may include irregular heartbeat (arrhythmia), faintness, chest pain, and may be fatal.

Prolonged or repeated exposure may cause target organ effects:

Respiratory Effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.

Additional Information:

Persons previously sensitized to isocyanates may develop a cross-sensitization reaction to other isocyanates.

Toxicological Data

If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Inhalation-		No data available; calculated ATE 10 - 20 mg/l

	Vapor(4 hr)		
Overall product	Ingestion		No data available; calculated ATE > 5,000 mg/kg
Polymeric Diphenylmethane Diisocyanate	Inhalation-Vapor		LC50 estimated to be 10 - 20 mg/l
Polymeric Diphenylmethane Diisocyanate	Dermal	Rabbit	LD50 > 5,000 mg/kg
Polymeric Diphenylmethane Diisocyanate	Inhalation-Dust/Mist (4 hours)	Rat	LC50 0.369 mg/l
Polymeric Diphenylmethane Diisocyanate	Ingestion	Rat	LD50 31,600 mg/kg
4,4' -Diphenylmethane Diisocyanate	Inhalation-Vapor		LC50 estimated to be 10 - 20 mg/l
4,4' -Diphenylmethane Diisocyanate	Dermal	Rabbit	LD50 > 5,000 mg/kg
4,4' -Diphenylmethane Diisocyanate	Inhalation-Dust/Mist (4 hours)	Rat	LC50 0.369 mg/l
4,4' -Diphenylmethane Diisocyanate	Ingestion	Rat	LD50 31,600 mg/kg
1,1,1,2-Tetrafluoroethane	Inhalation-Gas (4 hours)	Rat	LC50 > 359,300 ppm
Diphenylmethane-2,4'-Diisocyanate	Inhalation-Vapor		LC50 estimated to be 10 - 20 mg/l
Diphenylmethane-2,4'-Diisocyanate	Dermal	Rabbit	LD50 > 5,000 mg/kg
Diphenylmethane-2,4'-Diisocyanate	Inhalation-Dust/Mist (4 hours)	Rat	LC50 0.369 mg/l
Diphenylmethane-2,4'-Diisocyanate	Ingestion	Rat	LD50 31,600 mg/kg

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Polymeric Diphenylmethane Diisocyanate	official classification	Irritant
4,4' -Diphenylmethane Diisocyanate	official classification	Irritant
1,1,1,2-Tetrafluoroethane	Rabbit	No significant irritation
Diphenylmethane-2,4'-Diisocyanate	official classification	Irritant

Serious Eye Damage/Irritation

Name	Species	Value
Polymeric Diphenylmethane Diisocyanate	official classification	Severe irritant
4,4' -Diphenylmethane Diisocyanate	official classification	Severe irritant
1,1,1,2-Tetrafluoroethane	Rabbit	No significant irritation
Diphenylmethane-2,4'-Diisocyanate	official classification	Severe irritant

Skin Sensitization

Name	Species	Value
Polymeric Diphenylmethane Diisocyanate	official classification	Sensitizing
4,4' -Diphenylmethane Diisocyanate	official classification	Sensitizing
Diphenylmethane-2,4'-Diisocyanate	official classification	Sensitizing

	tion	
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Respiratory Sensitization

Name	Species	Value
Polymeric Diphenylmethane Diisocyanate	Human	Sensitizing
4,4' -Diphenylmethane Diisocyanate	Human	Sensitizing
Diphenylmethane-2,4'-Diisocyanate	Human	Sensitizing

Germ Cell Mutagenicity

Name	Route	Value
Polymeric Diphenylmethane Diisocyanate	In Vitro	Some positive data exist, but the data are not sufficient for classification
4,4' -Diphenylmethane Diisocyanate	In Vitro	Some positive data exist, but the data are not sufficient for classification
Diphenylmethane-2,4'-Diisocyanate	In Vitro	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity

Name	Route	Species	Value
Polymeric Diphenylmethane Diisocyanate	Inhalation	Rat	Some positive data exist, but the data are not sufficient for classification
4,4' -Diphenylmethane Diisocyanate	Inhalation	Rat	Some positive data exist, but the data are not sufficient for classification
Diphenylmethane-2,4'-Diisocyanate	Inhalation	Rat	Some positive data exist, but the data are not sufficient for classification

Reproductive Toxicity**Reproductive and/or Developmental Effects**

Name	Route	Value	Species	Test Result	Exposure Duration
Polymeric Diphenylmethane Diisocyanate	Inhalation	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 0.004 mg/l	during organogenesis
4,4' -Diphenylmethane Diisocyanate	Inhalation	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 0.004 mg/l	during organogenesis
Diphenylmethane-2,4'-Diisocyanate	Inhalation	Some positive developmental data exist, but the data are not sufficient for classification	Rat	NOAEL 0.004 mg/l	during organogenesis

Target Organ(s)**Specific Target Organ Toxicity - single exposure**

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Polymeric Diphenylmethane Diisocyanate	Inhalation	respiratory irritation	May cause respiratory irritation	official classification	NOAEL Not available	
4,4' -Diphenylmethane Diisocyanate	Inhalation	respiratory irritation	May cause respiratory irritation	official classification	NOAEL Not available	
1,1,1,2-Tetrafluoroethane	Inhalation	cardiac sensitization	May cause damage to organs	Dog	NOAEL 40,000 ppm	5 minutes
Diphenylmethane-2,4'-Diisocyanate	Inhalation	respiratory irritation	May cause respiratory irritation	official classification	NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Polymeric	Inhalation	respiratory system	Causes damage to organs	Rat	LOAEL	13 weeks

Diphenylmethane Diisocyanate			through prolonged or repeated exposure		0.004 mg/l	
4,4' -Diphenylmethane Diisocyanate	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.004 mg/l	13 weeks
Diphenylmethane-2,4'-Diisocyanate	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Rat	LOAEL 0.004 mg/l	13 weeks

Aspiration Hazard

For the component/components, either no data are currently available or the data are not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information**Ecotoxicological information**

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations**13.1. Disposal methods**

Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. As a disposal alternative, utilize an acceptable permitted waste disposal facility. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

For Transport Information, please visit <http://3M.com/Transportinfo> or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information**15.1. US Federal Regulations**

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - Yes Reactivity Hazard - Yes Immediate Hazard - Yes Delayed Hazard - Yes

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

<u>Ingredient</u>	<u>C.A.S. No</u>	<u>% by Wt</u>
Polymeric Diphenylmethane Diisocyanate	9016-87-9	60 - 100
Polymeric Diphenylmethane Diisocyanate (Benzene, 1,1'-methylenebis[4-isocyanato-])	9016-87-9	60 - 100
Polymeric Diphenylmethane Diisocyanate (DIISOCYANATES (CERTAIN CHEMICALS ONLY))	9016-87-9	60 - 100
4,4' -Diphenylmethane Diisocyanate	101-68-8	30 - 45
4,4' -Diphenylmethane Diisocyanate (Benzene, 1,1'-methylenebis[4-isocyanato-])	101-68-8	30 - 45
4,4' -Diphenylmethane Diisocyanate (DIISOCYANATES (CERTAIN CHEMICALS ONLY))	101-68-8	30 - 45

15.2. State Regulations

Contact 3M for more information.

15.3. Chemical Inventories

The components of this product are in compliance with the chemical notification requirements of TSCA.

Contact 3M for more information.

15.4. International Regulations

Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification

Health: 2 **Flammability:** 1 **Instability:** 1 **Special Hazards:** None

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

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