Safety Data Sheet Firestone Building Products Company

Section 1: Identification of the Substance/Mixture and of the Company/Undertaking

1.1 Product identifier

Product Name • **I.S.O. Twin Pack™ Insulation Adhesive Part A**

1.2 Relevant identified uses of the substance or mixture and uses advised against

Relevant identified use(s) • Construction

1.3 Details of the supplier of the safety data sheet

Manufacturer • Firestone Building Products Company

250 West 96th Street
Indianapolis, IN 46260
United States

firestonemsds@bfdp.com

Telephone (General) • 800-428-4442

1.4 Emergency telephone number

Manufacturer • (800) 424-9300 - CHEMTREC

Manufacturer • (703) 527-3887 - CHEMTREC - International

Section 2: Hazards Identification

EU/EEC

According to: Regulation (EC) No 1272/2008 (CLP)/REACH 1907/2006 [amended by 453/2010]
According to: EU Directive 67/548/EEC (DSD) or 1999/45/EC (DPD)

2.1 Classification of the substance or mixture

CLP • Skin Irritation 2 - H315
Skin Sensitization 1 - H317
Eye Irritation 2 - H319
Acute Toxicity Inhalation 3 - H331
Respiratory Sensitization 1 - H334
Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation - H335
Carcinogenicity 2 - H351
Specific Target Organ Toxicity Repeated Exposure 2 - H373

DSD/DPD • Harmful (Xn)
Irritant (Xi)
Carcinogenic Substances - Category 3
R20, R36/37/38, R40, R42/43, R48/20

2.2 Label Elements

CLP

DANGER

Hazard statements •
H315 - Causes skin irritation
H317 - May cause an allergic skin reaction
H319 - Causes serious eye irritation
H331 - Toxic if inhaled
H334 - May cause allergy or asthma symptoms or breathing difficulties if inhaled
H335 - May cause respiratory irritation
H351 - Suspected of causing cancer.
H373 - May cause damage to organs through prolonged or repeated exposure.

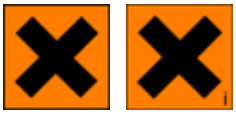
Precautionary statements

Prevention •
P201 - Obtain special instructions before use.
P202 - Do not handle until all safety precautions have been read and understood.
P260 - Do not breathe mist/vapours/spray.
P264 - Wash thoroughly after handling.
P271 - Use only outdoors or in a well-ventilated area.
P272 - Contaminated work clothing should not be allowed out of the workplace.
P280 - Wear protective gloves and eye/face protection , .
P281 - Use personal protective equipment as required.
P285 - In case of inadequate ventilation wear respiratory protection.

Response •
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
P342+P311 - If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P302+P352 - IF ON SKIN: Wash with plenty of soap and water.
P321 - Specific treatment, see supplemental first aid information.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P362 - Take off contaminated clothing and wash before reuse.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P308+P313 - IF exposed or concerned: Get medical advice/attention.
P314 - Get medical advice/attention if you feel unwell.

Storage/Disposal •
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P501 - Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

DSD/DPD



Risk phrases •
R20 - Harmful by inhalation.
R36/37/38 - Irritating to eyes, respiratory system and skin.
R40 - Limited evidence of a carcinogenic effect.
R42/43 - May cause sensitisation by inhalation and skin contact.
R48/20 - Harmful: danger of serious damage to health by prolonged exposure through inhalation.

Safety phrases •
S26 - In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36 - Wear suitable protective clothing.
S37 - Wear suitable gloves.
S45 - In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S53 - Avoid exposure - obtain special instructions before use.

2.3 Other Hazards

CLP • According to Regulation (EC) No. 1272/2008 (CLP) this material is considered hazardous.

DSD/DPD • According to European Directive 1999/45/EC this preparation is considered dangerous.

United States (US)

According to: OSHA 29 CFR 1910.1200 HCS

2.1 Classification of the substance or mixture

OSHA HCS 2012

- Skin Irritation 2
  Skin Sensitization 1A
  Eye Irritation 2
  Acute Toxicity Inhalation 2
  Respiratory Sensitization 1A
  Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
  Specific Target Organ Toxicity Repeated Exposure 1

2.2 Label elements

OSHA HCS 2012

DANGER

Hazard statements

- Causes skin irritation
  May cause an allergic skin reaction
  Causes serious eye irritation
  Fatal if inhaled
  May cause allergy or asthma symptoms or breathing difficulties if inhaled
  May cause respiratory irritation
  Causes damage to organs - Lungs through prolonged or repeated exposure via Inhalation

Precautionary statements

Prevention

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

Response

- IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
  If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
  If on skin: Wash with plenty of water .
  If skin irritation or rash occurs: Get medical advice/attention.
  Take off contaminated clothing and wash before reuse.
  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.
  Specific treatment is urgent, see supplemental first aid information.
  Get medical advice/attention if you feel unwell.

Storage/Disposal

- Store in a well-ventilated place. Keep container tightly closed.
  Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Supplemental information

- 75 percent of this product consists of an ingredient of unknown toxicity.

2.3 Other hazards

OSHA HCS 2012

- Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to: WHMIS

2.1 Classification of the substance or mixture

WHMIS

- Very Toxic - D1A
  Other Toxic Effects - D2A
  Other Toxic Effects - D2B

2.2 Label elements

WHMIS

- 

WHMIS

- Very Toxic - D1A
  Other Toxic Effects - D2A
  Other Toxic Effects - D2B

2.3 Other hazards

WHMIS

- In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on Ingredients

3.1 Substances

- Material does not meet the criteria of a substance.

3.2 Mixtures

Composition					
Chemical Name	**Identifiers**	**%**	**LD50/LC50**	**Classifications According to Regulation/Directive**	**Comments**
Polymethylene polyphenyl isocyanate	**CAS:**9016-87-9	25% TO 50%	Ingestion/Oral-Rat LD50 • 49 g/kg Inhalation-Rat LC50 • 490 mg/m³ 4 Hour(s) Skin-Rabbit LD50 • >9400 mg/kg	**EU DSD/DPD:** Self Classified: Xn, R20-48/20; Xn, R42/43, Xi, R36/37/38; Carc. 3, R40 **EU CLP:** Self Classified: Acute Tox. 2 (mist), H330; STOT RE 2, H373; Eye Irrit. 2, H319; STOT SE 3: Resp. Irrit., H335; Skin Irrit. 2, H315; Resp. Sens. 1, H334; Skin Sens. 1, H317; Carc. 2, H351 **OSHA HCS 2012:** Eye Irrit. 2; Skin Irrit. 2; Skin Sens. 1A; STOT SE 3: Resp. Irrit.; Resp. Sens. 1A; STOT RE 1(Lung); Acute Tox. 2 (inhl, mist)	NDA
Isocyanic acid, methylenedi-p-phenylene ester	**CAS:**101-68-8 **EC Number:**202-966-0 **EU Index:**615-005-00-9	25% TO 50%	Ingestion/Oral-Rat LD50 • 9200 mg/kg Inhalation-Rat LC50 • 178 mg/m³	**EU DSD/DPD:** Annex VI, Table 3.2: Carc. Cat. 3; R40; Xn; R20-48/20; Xi; R36/37/38, R42/43 **EU CLP:** Annex VI, Table 3.1: Carc. 2, H351; Acute Tox. 4, H332; STOT RE 2 *, H373; Eye Irrit. 2, H319; STOT SE 3: Resp. Irrit., H335; Skin Irrit. 2, H319; Resp. Sens. 1, H334; Skin Sens. 1, H317 **OSHA HCS 2012:** Skin Irrit. 2, Eye Irrit. 2, Skin Sens. 1, Resp. Sens. 1, STOT SE 3: Resp. Irrit.; STOT RE 1(Lungs);	NDA
Diphenylmethane diisocyanate	**CAS:**26447-40-5 **EC Number:**247-714-0 **EU Index:**615-005-00-9	2.5% TO 10%	NDA	**EU DSD/DPD:** Annex VI, Table 3.2: Carc. Cat. 3; R40; Xn; R20-48/20; Xi; R36/37/38;R42/43 **EU CLP:** Annex VI, Table 3.1: Carc. 2, H351; Acute Tox. 4 , H332; STOT RE 2, H373; Eye Irrit. 2, H319; STOT SE 3: Resp. Irrit., H335; Skin Irrit. 2, H315; Resp. Sens. 1, H334; Skin Sens. 1, H317 **OSHA HCS 2012:** Eye Irrit. 2; STOT SE 3: Resp. Irrit.; Skin Irrit. 2; Resp. Sens. 1A; Skin Sens. 1A; STOT RE 1	NDA

See Section 16 for full text of H-statements and R-phrases.

Section 4 - First Aid Measures

4.1 Description of first aid measures

Inhalation
- Move victim to fresh air. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. Keep patient warm. Get medical attention immediately if symptoms occur.

Skin
- Wash skin with soap and water. Take off contaminated clothing and wash before reuse. If irritation develops and persists, get medical attention.

Eye
- In case of contact with substance, immediately flush eyes with running water for at least 20 minutes. If eye irritation persists: Get medical advice/attention.

Ingestion
- Rinse mouth. Drink 1 - 2 glasses of water. Do NOT induce vomiting. Get medical attention immediately.

4.2 Most important symptoms and effects, both acute and delayed

- Refer to Section 11 - Toxicological Information.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to Physician
- All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Section 5 - Firefighting Measures

5.1 Extinguishing media

Suitable Extinguishing Media
- CO_2, extinguishing powder or water spray. Fight larger fires with water spray.

Unsuitable Extinguishing Media
- Do not use a direct stream of water.

5.2 Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards
- Dried solids can burn and release toxic fumes and vapors.

Hazardous Combustion Products
- No data available

5.3 Advice for firefighters

- Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
  Wear chemical protective clothing that is specifically recommended by the manufacturer. It may provide little or no thermal protection.
  Wear positive pressure self-contained breathing apparatus (SCBA).
  Move fire exposed containers if safe to do so. Cool fire exposed containers with water spray. Dike contaminated fire-control water for later disposal.

Section 6 - Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal Precautions
- Ventilate enclosed areas. Do not walk through spilled material. Wear appropriate personal protective equipment, avoid direct contact. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.

Emergency Procedures
- As an immediate precautionary measure, isolate spill or leak area in all directions for

at least 50 meters (150 feet) for liquids and at least 25 meters (75 feet) for solids. Stay upwind. Keep out of low areas. Keep unauthorized personnel away. Ventilate closed spaces before entering.

6.2 Environmental precautions

- Avoid release to the environment.

6.3 Methods and material for containment and cleaning up

Containment/Clean-up Measures

- Stop leak if you can do it without risk.
  Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
  LARGE SPILLS: Dike far ahead of spill for later disposal.

6.4 Reference to other sections

- Refer to Section 8 - Exposure Controls/Personal Protection and Section 13 - Disposal Considerations.

Section 7 - Handling and Storage

7.1 Precautions for safe handling

Handling

- Use only with adequate ventilation. Prevent formation of aerosols. Keep away from water as reaction can be initiated by water exposure. Persons with sensitivity to isocyanate should not handle/use this product. Wear appropriate personal protective equipment, avoid direct contact. Do not breath mist/vapours/spray. Avoid contact with skin, eyes, and clothing. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco.

7.2 Conditions for safe storage, including any incompatibilities

Storage

- Store in a cool, dry, well-ventilated place. Keep container tightly closed. Protect from atmospheric moisture. Keep away from heat, sparks and flame.

7.3 Specific end use(s)

- Refer to Section 1.2 - Relevant identified uses.

Section 8 - Exposure Controls/Personal Protection

8.1 Control parameters

Exposure Limits/Guidelines						
	Result	**ACGIH**	**Canada Alberta**	**Canada British Columbia**	**Canada Manitoba**	**Canada New Brunswick**
Isocyanic acid, methylenedi-p-phenylene ester (101-68-8)	TWAs	0.005 ppm TWA (listed under Methylene bisphenyl isocyanate (MDI))	0.005 ppm TWA; 0.05 mg/m3 TWA	0.005 ppm TWA (listed under Methylene bisphenyl isocyanate (MDI))	0.005 ppm TWA (listed under Methylene bisphenyl isocyanate (MDI))	0.005 ppm TWA (listed under Methylene bisphenyl isocyanate); 0.051 mg/m3 TWA (listed under Methylene bisphenyl isocyanate)
	Ceilings	Not established	Not established	0.01 ppm Ceiling (listed under Methylene bisphenyl isocyanate (MDI))	Not established	Not established
Polymethylene polyphenyl isocyanate (9016-87-9)	TWAs	Not established	0.005 ppm TWA; 0.07 mg/m3 TWA	Not established	Not established	Not established

Exposure Limits/Guidelines (Con't.)						
	Result	**Canada Northwest Territories**	**Canada Nova Scotia**	**Canada Nunavut**	**Canada Ontario**	**Canada Quebec**
Diphenylmethane diisocyanate (26447-40-5)	Ceilings	0.02 ppm Ceiling; 0.2 mg/m3 Ceiling	Not established	0.02 ppm Ceiling; 0.2 mg/m3 Ceiling	Not established	Not established
Isocyanic acid, methylenedi-p-phenylene ester (101-68-8)	TWAs	Not established	0.005 ppm TWA (listed under Methylene bisphenyl isocyanate (MDI))	Not established	0.005 ppm TWA (designated substances regulation, listed under Isocyanates, organic compounds (Methylene bisphenyl isocyanate (MDI))); 0.005 ppm TWA (applies to workplaces to which the designated substances regulation does not apply, listed under Methylene bisphenyl isocyanate (MDI))	0.005 ppm TWAEV; 0.051 mg/m3 TWAEV
	Ceilings	Not established	Not established	Not established	0.02 ppm Ceiling (designated substances regulation, listed under Isocyanates, organic compounds (Methylene bisphenyl isocyanate (MDI)))	Not established

Exposure Limits/Guidelines (Con't.)						
	Result	**Canada Saskatchewan**	**Canada Yukon**	**Denmark**	**Germany DFG**	**Germany TRGS**
Isocyanic acid, methylenedi-p-phenylene ester (101-68-8)	TWAs	0.005 ppm TWA (listed under Methylene bisphenyl isocyanate (MDI))	Not established	0.005 ppm TWA; 0.05 mg/m3 TWA	Not established	0.05 mg/m3 TWA AGW (The risk of damage to the embryo or fetus can be excluded when AGW and BGW values are observed, ceiling factor 2, exposure factor 1)
	Ceilings	Not established	0.02 ppm Ceiling (Methylene bisphenyl isocyanate (MDI)); 0.2 mg/m3 Ceiling (Methylene bisphenyl isocyanate (MDI))	Not established	0.05 mg/m3 Peak (inhalable fraction)	Not established
	MAKs	Not established	Not established	Not established	0.05 mg/m3 TWA MAK (see also polymeric MDI, inhalable fraction)	Not established
						0.05 mg/m3 TWA AGW (The risk of damage to the embryo or fetus can

Polymethylene polyphenyl isocyanate (9016-87-9)	TWAs	Not established	Not established	Not established	Not established	be excluded when AGW and BGW values are observed, inhalable fraction, as MDI, exposure factor 1)
	Ceilings	Not established	Not established	Not established	0.05 mg/m3 Peak (inhalable fraction)	Not established
	MAKs	Not established	Not established	Not established	0.05 mg/m3 TWA MAK (inhalable fraction)	Not established

Exposure Limits/Guidelines (Con't.)

	Result	NIOSH	OSHA
Diphenylmethane diisocyanate (26447-40-5)	Ceilings	Not established	0.02 ppm Ceiling; 0.2 mg/m3 Ceiling
Isocyanic acid, methylenedi-p-phenylene ester (101-68-8)	Ceilings	0.020 ppm Ceiling (10 min); 0.2 mg/m3 Ceiling (10 min)	0.02 ppm Ceiling; 0.2 mg/m3 Ceiling
	TWAs	0.005 ppm TWA (listed under Methylene bisphenyl isocyanate); 0.05 mg/m3 TWA	Not established

Exposure Control Notations

Germany TRGS

•Isocyanic acid, methylenedi-p-phenylene ester (101-68-8): **Carcinogens:** (Category 3 (as inhalable aerosol, alveola fraction)) | **Developmental Toxins:** (Based on current data, this substance cannot be classified in categories 1-3 (as inhalable aerosol, alveoli fraction)) | **Reproductive Toxins:** (Based on current data, this substance cannot be classified in categories 1-3 (as inhalable aerosol, alveola fraction)) | **Germ Cell Mutagens:** (Based on current data, this substance cannot be classified in categories 1-3 (as inhalable aerosol, alveola fraction))

•Polymethylene polyphenyl isocyanate (9016-87-9): **Carcinogens:** (Category 3 (as inhalable aerosol, alveola fraction)) | **Developmental Toxins:** (Based on current data, this substance cannot be classified in categories 1-3 (as inhalable aerosol, alveoli fraction)) | **Reproductive Toxins:** (Based on current data, this substance cannot be classified in categories 1-3 (as inhalable aerosol, alveola fraction)) | **Germ Cell Mutagens:** (Based on current data, this substance cannot be classified in categories 1-3 (as inhalable aerosol, alveola fraction)) | **Skin:** (skin notation (calculated as MDI))

Germany DFG

•Isocyanic acid, methylenedi-p-phenylene ester (101-68-8): **Carcinogens:** (Category 4 (no significant contribution to human cancer)) | **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to (inhalable fraction, see also polymeric MDI)) | **Sensitizers:** (respiratory and skin sensitizer (inhalable fraction)) | **Skin:** (skin notation)

•Polymethylene polyphenyl isocyanate (9016-87-9): **Carcinogens:** (Category 4 (no significant contribution to human cancer)) | **Pregnancy:** (no risk to embryo/fetus if exposure limits adhered to (inhalable fraction)) | **Sensitizers:** (respiratory and skin sensitizer (inhalable fraction)) | **Skin:** (skin notation)

Exposure Limits Supplemental

ACGIH

•Isocyanic acid, methylenedi-p-phenylene ester (101-68-8): **TLV Basis - Critical Effects:** (respiratory sensitization (listed under Methylene bisphenyl isocyanate (MDI)))

8.2 Exposure controls

Engineering Measures/Controls

- This material is designed to be used outdoors, in roofing applications. Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Personal Protective Equipment

Respiratory

- In case of insufficient ventilation, wear suitable respiratory equipment. Follow the OSHA respirator regulations found in 29 CFR 1910.134 or European Standard EN 149. Use a NIOSH or European Standard EN 149 approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face

- Wear chemical splash safety goggles.

Skin/Body	• Wear appropriate gloves. Chloroprene rubber, CR. Nitrile rubber, NBR. Butyl rubber, BR Wear appropriate chemical resistant clothing.
Environmental Exposure Controls	• In case of spills, keep product clear of sewers, waterways or land areas. Dispose of waste product in accordance with national and local laws and regulations.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene

TWAEV = Time-Weighted Average Exposure Value

TWA = Time-Weighted Averages are based on 8h/day, 40h/week exposures

MAK = Maximale Arbeitsplatz Konzentration is the maximum permissible concentration

NIOSH = National Institute of Occupational Safety and Health

OSHA = Occupational Safety and Health Administration

Section 9 - Physical and Chemical Properties

9.1 Information on Physical and Chemical Properties

Material Description			
Physical Form	Liquid	Appearance/Description	Off white to light amber liquid with faint aromatic odor.
Color	Off White - Light Amber.	Odor	Faint Aromatic.
Odor Threshold	Data lacking		
General Properties			
Boiling Point	Data lacking	Melting Point/Freezing Point	Not relevant
Decomposition Temperature	Data lacking	pH	Data lacking
Specific Gravity/Relative Density	= 1.12 @ 20 °C(68 °F) Water=1	Water Solubility	Insoluble
Viscosity	Data lacking	Explosive Properties	Data lacking
Oxidizing Properties:	Data lacking		
Volatility			
Vapor Pressure	0 mmHg (torr)	Vapor Density	Data lacking
Evaporation Rate	Data lacking		
Flammability			
Flash Point	176 °C(348.8 °F)	UEL	Data lacking
LEL	0.4 %	Autoignition	> 482 °F(> 250 °C)
Flammability (solid, gas)	Data lacking		
Environmental			
Octanol/Water Partition coefficient	Data lacking		

9.2 Other Information

- No additional physical and chemical parameters noted.

Section 10: Stability and Reactivity

10.1 Reactivity

- There is a potential for violent reaction if contaminated with water.

10.2 Chemical stability

- Stable under normal temperatures and pressures.

10.3 Possibility of hazardous reactions

- Danger of polymerization. Reacts violently with water.

10.4 Conditions to avoid

- Contact with moisture, other materials that react with isocyanates, or temperatures

above 350ºF (177ºC), may cause polymerization.

10.5 Incompatible materials

- Reacts with amines, caustic alkali solutions, alcohols, ammonia, oxidizers, acids, polyols. Reacts with water forming carbon dioxide-may rupture sealed containers if contaminated with water. May produce violent reactions with bases and numerous organic substances including alcohols and amines.

10.6 Hazardous decomposition products

- Carbon dioxide, carbon monoxide, oxides of nitrogen, dense black smoke, hydrogen cyanide, isocyanic acid, other undeterminated compounds.

Section 11 - Toxicological Information

11.1 Information on toxicological effects

Components		
Isocyanic acid, methylenedi-p-phenylene ester (25% TO 50%)	101-68-8	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 9200 mg/kg; *Behavioral*:**Somnolence (general depressed activity)**; *Behavioral*:**Ataxia**; *Nutritional and Gross Metabolic:Changes in Chemistry or Temperature*:**Body temperature decrease**; Inhalation-Rat LC50 • 178 mg/m³; **Irritation:** Eye-Rabbit • 100 mg • Moderate irritation; Skin-Rabbit • 500 mg 24 Hour(s); **Mutagen:** DNA adduct • Inhalation-Rat • 2 mg/m³ 52 Week(s)-Intermittent; Micronucleus test • Inhalation-Rat • 7.1 mg/m³ 3 Hour(s); DNA adduct • Inhalation-Rat • 0.002 mg/L 17 Hour(s) 1 Year(s); **Reproductive:** Inhalation-Rat TCLo • 9 mg/m³ 6 Hour(s)(6-15D preg); *Reproductive Effects:Maternal Effects*:**Other effects**; *Reproductive Effects:Specific Developmental Abnormalities*:**Musculoskeletal system**
Polymethylene polyphenyl isocyanate (25% TO 50%)	9016-87-9	**Acute Toxicity:** Ingestion/Oral-Rat LD50 • 49 g/kg; *Behavioral*:**Somnolence (general depressed activity)**; *Gastrointestinal*:**Hypermotility, diarrhea**; *Nutritional and Gross Metabolic:Changes in Chemistry or Temperature*:**Body temperature decrease**; Inhalation-Rat LC50 • 490 mg/m³ 4 Hour(s); *Sense Organs and Special Senses:Eye*:**Other**; *Lungs, Thorax, or Respiration*:**Respiratory depression**; *Blood*:**Hemorrhage**; Skin -Rabbit LD50 • >9400 mg/kg; **Irritation:** Eye-Rabbit • 100 mg • Mild irritation; **Reproductive:** Inhalation-Rat TCLo • 12 mg/m³ 6 Hour(s)(6-15D preg); *Reproductive Effects:Maternal Effects*:**Other effects**; *Reproductive Effects:Effects on Embryo or Fetus*:**Extra embryonic structures**; *Reproductive Effects:Specific Developmental Abnormalities*:**Musculoskeletal system**

GHS Properties	Classification
Acute toxicity	**EU/CLP** • Acute Toxicity - Inhalation 3 - ATEmix(inhl)=0.748 mg/L **OSHA HCS 2012** • Acute Toxicity - Inhalation 2 - ATEmix(inhl)=0.49 mg/L
Skin corrosion/Irritation	**EU/CLP** • Skin Irritation 2 **OSHA HCS 2012** • Skin Irritation 2
Serious eye damage/Irritation	**EU/CLP** • Eye Irritation 2 **OSHA HCS 2012** • Eye Irritation 2
Skin sensitization	**EU/CLP** • Skin Sensitizer 1 **OSHA HCS 2012** • Skin Sensitizer 1A
Respiratory sensitization	**EU/CLP** • Respiratory Sensitizer 1 **OSHA HCS 2012** • Respiratory Sensitizer 1A
Aspiration Hazard	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
Carcinogenicity	**EU/CLP** • Carcinogenicity 2 **OSHA HCS 2012** • Classification criteria not met
Germ Cell Mutagenicity	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met

Toxicity for Reproduction	**EU/CLP** • Classification criteria not met **OSHA HCS 2012** • Classification criteria not met
STOT-SE	**EU/CLP** • Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation **OSHA HCS 2012** • Specific Target Organ Toxicity Single Exposure 3: Respiratory Tract Irritation
STOT-RE	**EU/CLP** • Specific Target Organ Toxicity Repeated Exposure 2 **OSHA HCS 2012** • Specific Target Organ Toxicity Repeated Exposure 1

Potential Health Effects

Inhalation

Acute (Immediate)
- Toxic if inhaled. May cause respiratory irritation.

Chronic (Delayed)
- May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Skin

Acute (Immediate)
- Causes skin irritation. May cause skin sensitization. Symptoms include redness and skin rash.

Chronic (Delayed)
- No data available.

Eye

Acute (Immediate)
- Causes serious eye irritation.

Chronic (Delayed)
- No data available.

Ingestion

Acute (Immediate)
- Although swallowing this product is an unlikely means of exposure, irritation of the mouth, pharynx, esophagus and stomach can develop following ingestion.

Chronic (Delayed)
- No data available

Other

Chronic (Delayed)
- Causes damage to the lungs through prolonged or repeated exposure via Inhalation. Long-term effect of Isocyanic acid, methylenedi-p-phenylene ester on the respiratory system of 318 workers suggests that such workers may develop fibrosis. Long-term exposure tends to restrict pulmonary function and cause decrease in CO single breath transfer factor.

Carcinogenic Effects
- May cause cancer.

Key to abbreviations

LC = Lethal Concentration
LD = Lethal Dose
TC = Toxic Concentration

Section 12 - Ecological Information

12.1 Toxicity

- Material data lacking.

12.2 Persistence and degradability

- Material data lacking.

12.3 Bioaccumulative potential

- Material data lacking.

12.4 Mobility in Soil

- Material data lacking.

12.5 Results of PBT and vPvB assessment

- No PBT and vPvB assessment has been conducted.

12.6 Other adverse effects

- No studies have been found.

Section 13 - Disposal Considerations

13.1 Waste treatment methods

Product waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste
- Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport Information

	14.1 UN number	14.2 UN proper shipping name	14.3 Transport hazard class(es)	14.4 Packing group	14.5 Environmental hazards
DOT	NDA	Not Regulated	NDA	NDA	NDA
TDG	NDA	Not Regulated	NDA	NDA	NDA
IMO/IMDG	NDA	Not Regulated	NDA	NDA	NDA
IATA/ICAO	NDA	Not Regulated	NDA	NDA	NDA

14.6 Special precautions for user
- None specified.

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
- Data lacking.

Section 15 - Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications
- Acute, Chronic

State Right To Know				
Component	**CAS**	**MA**	**NJ**	**PA**
Diphenylmethane diisocyanate	26447-40-5	Yes	Yes	No
Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	No	No	Yes
Polymethylene polyphenyl isocyanate	9016-87-9	No	Yes	No

Inventory						
Component	**CAS**	**Canada DSL**	**Canada NDSL**	**EU EINECS**	**EU ELNICS**	**TSCA**
Diphenylmethane diisocyanate	26447-40-5	Yes	No	Yes	No	Yes

Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Yes	No	Yes	No	Yes
Polymethylene polyphenyl isocyanate	9016-87-9	Yes	No	No	No	Yes

Belgium

Labor

Belgium - Substances and Preparations - Carcinogens and Mutagens

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Canada

Labor

Canada - WHMIS - Classifications of Substances

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	D1A, D2A, D2B
• Polymethylene polyphenyl isocyanate	9016-87-9	D1A, D2A, D2B

Canada - WHMIS - Ingredient Disclosure List

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	0.1 %
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Environment

Canada - CEPA - Priority Substances List

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Denmark

Environment

Denmark - List of Undesirable Substances - Product Groups/Function

• Diphenylmethane diisocyanate	26447-40-5	Binders (listed under Certain isocyanates); Curing agents (listed under Certain isocyanates); Glues (listed under Certain isocyanates); Paints (listed under Certain isocyanates); Coatings (listed under Certain isocyanates); Molding compounds (listed under Certain isocyanates)
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Binders; Curing agents; Glues; Paints; Coatings; Molding compounds
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Europe

Other

EU - CLP (1272/2008) - Annex VI - Table 3.2 - Classification

• Diphenylmethane diisocyanate	26447-40-5	Xn; R20-48/20 Xi; R36/37/38 Carc.Cat.3; R40 R42/43
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Xn; R20-48/20 Xi; R36/37/38 Carc.Cat.3; R40 R42/43
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Concentration Limits		
• Diphenylmethane diisocyanate	26447-40-5	5%<=C: Xi; R:36/37/38 0.1% <=C: R:42
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	5%<=C: Xi; R:36/37/38 0.1% <=C: R:42
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Labelling		
• Diphenylmethane diisocyanate	26447-40-5	Xn R:20-36/37/38-40-42/43-48/20 S:(1/2)-23-36/37-45
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Xn R:20-36/37/38-40-42/43-48/20 S:(1/2)-23-36/37-45
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Notes - Substances and Preparations		
• Diphenylmethane diisocyanate	26447-40-5	C, 2
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	C, 2
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed
EU - CLP (1272/2008) - Annex VI - Table 3.2 - Safety Phrases		
• Diphenylmethane diisocyanate	26447-40-5	S:(1/2)-23-36/37-45
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	S:(1/2)-23-36/37-45
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany

Labor

Germany - Immission Control - Qualifying Quantities for Major Accident Prevention		
• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed
Germany - Immission Control - Qualifying Quantities for Safety Reporting		
• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed
Germany - TRGS 505 - Specific Lead Regulations		
• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed
Germany - TRGS 511 - Specific Ammonium Nitrate Regulations		
• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Environment

Germany - TA Luft - Types and Classes		
• Diphenylmethane diisocyanate	26447-40-5	Not Listed

• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	organic Substance: 5.2.5, Class I
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - TA Luft - Emission Limits for Carcinogenic Substances

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - TA Luft - Emission Limits for Fibers

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - TA Luft - Emission Limits for Inorganic Dusts

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - TA Luft - Emission Limits for Inorganic Gases

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - TA Luft - Emission Limits for Organic Substances

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	0.10 kg/h Mass flow (Class I); 20 mg/m3 Mass concentration (Class I)
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - Water Classification (VwVwS) - Annex 1

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - Water Classification (VwVwS) - Annex 2 - Water Hazard Classes

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	ID Number 635, hazard class 1 - low hazard to waters
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Germany - Water Classification (VwVwS) - Annex 3

• Diphenylmethane diisocyanate	26447-40-5	ID Number 8322, hazard class 1 - low hazard to waters
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

Environment

U.S. - CAA (Clean Air Act) - 1990 Hazardous Air Pollutants

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	(listed under Methylene diphenyl diisocyanate)
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	5000 lb final RQ; 2270 kg final RQ
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - CERCLA/SARA - Section 313 - Emission Reporting

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	1.0 % de minimis concentration (listed under Chemical Category N120, Diisocyanates)
• Polymethylene polyphenyl isocyanate	9016-87-9	1.0 % de minimis concentration (listed under Chemical Category N120, Diisocyanates)

U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - California - Proposition 65 - Developmental Toxicity

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Female

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - California - Proposition 65 - Reproductive Toxicity - Male

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

United States - Pennsylvania

Labor

U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

U.S. - Pennsylvania - RTK (Right to Know) - Special Hazardous Substances

• Diphenylmethane diisocyanate	26447-40-5	Not Listed
• Isocyanic acid, methylenedi-p-phenylene ester	101-68-8	Not Listed
• Polymethylene polyphenyl isocyanate	9016-87-9	Not Listed

15.2 Chemical Safety Assessment

- No Chemical Safety Assessment has been carried out.

Section 16 - Other Information

Relevant Phrases (code & full text)

- H330 - Fatal if inhaled
  H332 - Harmful if inhaled

Revision Date
- 20/June/2016

Preparation Date
- 18/October/2011

Other Information
- Update due to incorrectly identifying product as Part 1 in product name. Updated to Part A

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Key to abbreviations

NDA = No Data Available