

Franklin International

Material Safety Data Sheet

Titebond WW60

1. Product and company identification

CAS #	: 154007-08-6
Synonym	: Diphenylmethane diisocyanate, caprolactone, 1,6-hexanediol, 1,4-butanediol, adipic acid polymer; Diphenylmethanediisocyanate, .epsilon.-caprolactone, 1,6-hexanediol, 1,4-butanediol, adipic acid polymer
Address	: Franklin International 2020 Bruck Street Columbus OH 43207
Contact person	: Franklin Technical Services
Telephone	: (800) 877-4583
<u>In case of emergency</u>	: Franklin Security (614) 445-1300
Reference number	: 7029
Product code	: 1311
Date of revision	: 10/31/2012.
Print date	: 10/31/2012.
Chemtrec (24 Hour)	: (800) 424 - 9300
Chemtrec International	: (703) 527 - 3887
Chemical family	: Adhesive.
Product use	: REACTIVE HHOT MELT MDI

2. Hazards identification

Emergency overview

Physical state	: Solid.
Color	: White.
Odor	: Faint odor.
Signal word	: WARNING!
Hazard statements	: CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY CAUSE RESPIRATORY TRACT IRRITATION. Contact with hot material causes thermal skin burns. Contains isocyanates.
Precautionary measures	: Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Keep container tightly closed. Wash thoroughly after handling.
OSHA/HCS status	: This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Routes of entry	: Dermal contact. Eye contact. Inhalation. Ingestion.
<u>Potential acute health effects</u>	
Inhalation	: Slightly irritating to the respiratory system. May cause sensitization by inhalation. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure. Contains isocyanates. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
Ingestion	: No known significant effects or critical hazards.

2. Hazards identification

Skin : Irritating to skin. May cause sensitization by skin contact. Heated material can cause thermal burns. Contains isocyanates. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. May be harmful if absorbed through skin.

Eyes : Irritating to eyes. Heated material can cause thermal burns.

Potential chronic health effects

Chronic effects : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Target organs : May cause damage to the following organs: skin.
Contains material which may cause damage to the following organs: lungs, upper respiratory tract, eye, lens or cornea, nose/sinuses, testes, throat.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
respiratory tract irritation
coughing
wheezing and breathing difficulties
asthma

Ingestion : No specific data.

Skin : Adverse symptoms may include the following:
irritation
redness

Eyes : Adverse symptoms may include the following:
pain or irritation
watering
redness

Medical conditions aggravated by over-exposure : Pre-existing respiratory and skin disorders may be aggravated by over-exposure to this product.

See toxicological information (Section 11)

3. Composition/information on ingredients

United States

Name	CAS number	%
4,4'-methylenediphenyl diisocyanate	101-68-8	1 - 5

Canada

Name	CAS number	%
methylenediphenyl diisocyanate	26447-40-5	1 - 5
4,4'-methylenediphenyl diisocyanate	101-68-8	1 - 5

Mexico

Name	CAS number	UN number	%	IDLH	Classification			
					H	F	R	Special
4,4'-methylenediphenyl diisocyanate	101-68-8	Not available.	1 - 5	75 mg/m ³	2	1	0	-

3. Composition/information on ingredients

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately. May react in the presence of moisture.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.
- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

5. Fire-fighting measures

- Flammability of the product** : No specific fire or explosion hazard.
- Extinguishing media**
- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training. Moisture-reactive material.
- Special protective equipment for fire-fighters** : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

6. Accidental release measures

- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems or asthma, allergies or chronic or recurrent respiratory disease should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

- Storage** : Store between the following temperatures: 23.889 to 40.556°C (75 to 105°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Contains moisture-sensitive material. Store in a dry place.

8. Exposure controls/personal protection

United States

Ingredient	Exposure limits
4,4'-methylenediphenyl diisocyanate	<p>ACGIH TLV (United States, 3/2012). TWA: 0.005 ppm 8 hour(s).</p> <p>OSHA PEL 1989 (United States, 3/1989). CEIL: 0.02 ppm CEIL: 0.2 mg/m³</p> <p>NIOSH REL (United States, 6/2009). TWA: 0.05 mg/m³ 10 hour(s). TWA: 0.005 ppm 10 hour(s). CEIL: 0.2 mg/m³ 10 minute(s). CEIL: 0.02 ppm 10 minute(s).</p> <p>OSHA PEL (United States, 6/2010). CEIL: 0.02 ppm CEIL: 0.2 mg/m³</p>

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			Notations
Ingredient	List name	ppm	mg/m ³	Other	ppm	mg/m ³	Other	ppm	mg/m ³	Other	
4,4'-methylenediphenyl diisocyanate	US ACGIH 3/2012	0.005	-	-	-	-	-	-	-	-	[1][3]
	AB 4/2009	0.005	0.05	-	-	-	-	-	-	-	
	BC 9/2011	0.005	-	-	-	-	-	0.01	-	-	
	ON 7/2010	0.005	-	-	-	-	-	-	-	-	
methylenediphenyl diisocyanate	QC 9/2011	0.005	0.051	-	-	-	-	-	-	-	[3]
	BC 9/2011	0.005	-	-	-	-	-	0.01	-	-	
	ON 7/2010	0.005	-	-	-	-	-	0.02	-	-	

[1]Absorbed through skin. [3]Skin sensitization

Mexico

Occupational exposure limits

8. Exposure controls/personal protection

Ingredient	Exposure limits
4,4'-methylenediphenyl diisocyanate	NOM-010-STPS (Mexico, 9/2000). LMPE-PPT: 0.005 ppm 8 hour(s). LMPE-PPT: 0.051 mg/m ³ 8 hour(s).

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.
- Hands** : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation.

9. Physical and chemical properties

- Physical state** : Solid.
- Flash point** : Closed cup: >93.3°C (>199.9°F) [Setaflash.]
- Color** : White.
- Odor** : Faint odor.
- Relative density** : 1.17
- Volatility** : 0% (w/w)
- VOC (less water, less exempt solvents)** : 0 g/l
- Solubility** : Insoluble in the following materials: cold water and hot water.

10. Stability and reactivity

- Chemical stability** : The product is stable.
- Conditions to avoid** : No specific data.
- Incompatible materials** : No specific data.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced. Decomposes and releases toxic gases when exposed to high temperature or when burning.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Hazardous polymerization** : Under normal conditions of storage and use, hazardous polymerization will not occur.
- Incompatibility** : Reactive or incompatible with the following materials: acids, alkalis and moisture.

11. Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
4,4'-methylenediphenyl diisocyanate	LD50 Oral	Rat	9200 mg/kg	-

Chronic toxicity

- Conclusion/Summary** : Contains isocyanates. May cause allergic reactions in certain individuals. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
4,4'-methylenediphenyl diisocyanate	Eyes - Moderate irritant	Rabbit	-	100 milligrams	-

Conclusion/Summary

- Skin** : Heated material can cause thermal burns. Contains isocyanates. May be harmful if absorbed through skin.
- Eyes** : Heated material can cause thermal burns.
- Respiratory** : Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Sensitizer

Conclusion/Summary

- Skin** : Contains isocyanates. May cause sensitization by skin contact. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Respiratory** : Contains isocyanates. May cause sensitization by inhalation. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
4,4'-methylenediphenyl diisocyanate	-	3	-	-	-	-

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Reproductive toxicity

No known significant effects or critical hazards.

11. Toxicological information

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
4,4'-methylenediphenyl diisocyanate	LD50 Oral	Rat	9200 mg/kg	-

Chronic toxicity

Conclusion/Summary : Contains isocyanates. May cause allergic reactions in certain individuals. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
4,4'-methylenediphenyl diisocyanate	Eyes - Moderate irritant	Rabbit	-	100 milligrams	-

Conclusion/Summary

Skin : Heated material can cause thermal burns. Contains isocyanates. May be harmful if absorbed through skin.

Eyes : Heated material can cause thermal burns.

Respiratory : Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Sensitizer

Conclusion/Summary

Skin : Contains isocyanates. May cause sensitization by skin contact. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Respiratory : Contains isocyanates. May cause sensitization by inhalation. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
4,4'-methylenediphenyl diisocyanate	-	3	-	-	-	-

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Reproductive toxicity

No known significant effects or critical hazards.

Mexico

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
4,4'-methylenediphenyl diisocyanate	LD50 Oral	Rat	9200 mg/kg	-

Chronic toxicity

Conclusion/Summary : Contains isocyanates. May cause allergic reactions in certain individuals. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
-	Eyes - Moderate irritant	Rabbit	-	100 milligrams	-

11. Toxicological information

Conclusion/Summary

- Skin** : Heated material can cause thermal burns. Contains isocyanates. May be harmful if absorbed through skin.
- Eyes** : Heated material can cause thermal burns.
- Respiratory** : Inhalation of oil mist or vapors at elevated temperatures may cause respiratory irritation.

Sensitizer

Conclusion/Summary

- Skin** : Contains isocyanates. May cause sensitization by skin contact. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Respiratory** : Contains isocyanates. May cause sensitization by inhalation. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Carcinogenicity

Classification

Product/ingredient name	ACGIH	IARC	EPA	NIOSH	NTP	OSHA
4,4'-methylenediphenyl diisocyanate	-	3	-	-	-	-

Mutagenicity

No known significant effects or critical hazards.

Teratogenicity

No known significant effects or critical hazards.

Reproductive toxicity

No known significant effects or critical hazards.

12. Ecological information

Ecotoxicity : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

No known significant effects or critical hazards.

Persistence/degradability

No known significant effects or critical hazards.

Canada

Aquatic ecotoxicity

No known significant effects or critical hazards.

Persistence/degradability

No known significant effects or critical hazards.

Mexico

Aquatic ecotoxicity

No known significant effects or critical hazards.

Persistence/degradability

No known significant effects or critical hazards.

13. Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

Regulatory information	UN number	Proper shipping name	Classes	PG*	Label	Additional information
DOT Classification	Not regulated.	-	-	-		-
TDG Classification	Not regulated.	-	-	-		-
Mexico Classification	Not regulated.	-	-	-		-
ADR/RID Class	Not regulated.	-	-	-		-
IMDG Class	Not regulated.	-	-	-		-
IATA-DGR Class	Not regulated.	-	-	-		-

PG* : Packing group

15. Regulatory information

United States

HCS Classification : Irritating material
Sensitizing material

U.S. Federal regulations :
TSCA 8(a) PAIR: 4,4'-methylenediphenyl diisocyanate; methylenediphenyl diisocyanate
TSCA 8(a) IUR Exempt/Partial exemption: All components are listed or exempted.

United States inventory (TSCA 8b): All components are listed or exempted.

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: 4,4'-methylenediphenyl diisocyanate

SARA 311/312 MSDS distribution - chemical inventory - hazard identification:

Titebond WW60: Immediate (acute) health hazard, Delayed (chronic) health hazard

15. Regulatory information

- Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)** : Listed
- Clean Air Act Section 602 Class I Substances** : Not listed
- Clean Air Act Section 602 Class II Substances** : Not listed
- DEA List I Chemicals (Precursor Chemicals)** : Not listed
- DEA List II Chemicals (Essential Chemicals)** : Not listed

SARA 313

	Product name	CAS number	Concentration
Form R - Reporting requirements	4,4'-methylenediphenyl diisocyanate	101-68-8	1 - 5
Supplier notification	4,4'-methylenediphenyl diisocyanate	101-68-8	1 - 5

SARA 313 notifications must not be detached from the MSDS and any copying and redistribution of the MSDS shall include copying and redistribution of the notice attached to copies of the MSDS subsequently redistributed.

State regulations

- Massachusetts** : The following components are listed: METHYLENE BISPHENYL ISOCYANATE (MDI)
- New York** : The following components are listed: Methylene diphenyl diisocyanate
- New Jersey** : The following components are listed: METHYLENE BISPHENYL ISOCYANATE; BENZENE, 1,1'-METHYLENEBIS[4-ISOCYANATO-; DIISOCYANATES
- Pennsylvania** : The following components are listed: BENZENE, 1,1'-METHYLENEBIS[4-ISOCYANATO-

Canada

- WHMIS (Canada)** : Class D-1A: Material causing immediate and serious toxic effects (Very toxic).
Class D-2A: Material causing other toxic effects (Very toxic).
Class D-2B: Material causing other toxic effects (Toxic).

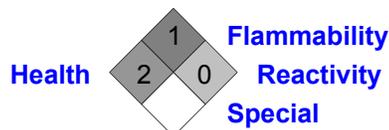
Canadian lists

- Canadian NPRI** : The following components are listed: Methylenebis(phenylisocyanate)
- CEPA Toxic substances** : None of the components are listed.
- Canada inventory** : At least one component is not listed in DSL but all such components are listed in NDSL.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

Mexico

- Classification** :



International regulations

- International lists** :
- Australia inventory (AICS)**: Not determined.
 - China inventory (IECSC)**: Not determined.
 - Japan inventory**: Not determined.
 - Korea inventory**: Not determined.
 - New Zealand Inventory of Chemicals (NZIoC)**: Not determined.
 - Philippines inventory (PICCS)**: Not determined.

15. Regulatory information

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

16. Other information

Label requirements : CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY CAUSE RESPIRATORY TRACT IRRITATION. Contact with hot material causes thermal skin burns. Contains isocyanates.

Hazardous Material Information System (U.S.A.) :

Health	2
Flammability	1
Physical hazards	1

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.) :



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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

Date of printing : 10/31/2012.

Date of issue : 10/31/2012.

Date of previous issue : 4/27/2012.

Version : 2

☑ Indicates information that has changed from previously issued version.

[Notice to reader](#)

16. Other information

To the best of our knowledge, the information contained herein is accurate. However, neither the above-named supplier, nor any of its subsidiaries, assumes any liability whatsoever for the accuracy or completeness of the information contained herein.

Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.