Franklin International

Material Safety Data Sheet

Product name : Titebond Polyurethane Glue

1 . Product and company identification

CAS #	:	53862-89-8
Address	:	Franklin International 2020 Bruck Street Columbus OH 43207
Contact person	:	Franklin Technical Services
Telephone	:	(800) 877-4583
Emergency phone:	:	Franklin Security (614) 445-1300
Reference number	:	3810
Product code	:	2300
Date of revision	:	10/21/2010.
Print date	:	10/22/2010.
Chemtrec (24 Hour)	:	(800) 424 - 9300
Chemtrec International	:	(703) 527 - 3887
Chemical family	:	Adhesive.
Product use	:	Polyurethane Adhesive
Product type	:	MDI

2 . Hazards identification

Physical state	:	Liquid.
Odor	:	Faint odor.
OSHA/HCS status	:	This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).
Emergency overview	:	WARNING! CAUSES EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY CAUSE RESPIRATORY TRACT IRRITATION. Contains isocyanates. Irritating to eyes and skin. Slightly irritating to the respiratory system. May cause sensitization by inhalation and skin contact. Do not breathe vapor or mist. Do not get on skin or clothing. Avoid contact with eyes. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.
Routes of entry	:	Dermal contact. Eye contact. Inhalation. Ingestion.

Potential acute health effects

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.
Skin	:	Irritating to skin. May cause sensitization by skin contact. 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. This product may irritate eyes upon contact.

2 . Hazards identification

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, 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	%
Diphenylmethane-4,4’-diisocyanate	101-68-8	10 - 25

Canada

Name	CAS number	%
Diphenylmethane-4,4’-diisocyanate	101-68-8	10 - 25
Polymethylenepolyphenyl isocyanate	9016-87-9	5 - 10
methylenediphenyl diisocyanate	26447-40-5	1 - 5

Mexico

Name	CAS number	UN number	%	IDLH	Classification			
					H	F	R	Special
Diphenylmethane-4,4’-diisocyanate	101-68-8	Not available.	10 - 25	75 mg/m³	0	1	0	

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 : In a fire or if heated, a pressure increase will occur and the container may burst.

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. Avoid breathing vapor or mist. 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 : Stop leak if without risk. Move containers from spill area. Dispose of via a licensed waste disposal contractor. Absorb with an inert material.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. 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. Avoid breathing vapor or mist. 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 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
Diphenylmethane-4,4'-diisocyanate	**ACGIH TLV (United States, 2/2010).** TWA: 0.005 ppm 8 hour(s). **OSHA PEL 1989 (United States, 3/1989).** CEIL: 0.02 ppm CEIL: 0.2 mg/m³ **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). **OSHA PEL (United States, 6/2010).** CEIL: 0.02 ppm CEIL: 0.2 mg/m³

Canada

Occupational exposure limits		TWA (8 hours)			STEL (15 mins)			Ceiling			
Ingredient	List name	ppm	mg/m³	Other	ppm	mg/m³	Other	ppm	mg/m³	Other	Notations
Diphenylmethane-4,4'-diisocyanate	US ACGIH 2/2010	0.005	-	-	-	-	-	-	-	-	
	AB 4/2009	0.005	0.05	-	-	-	-	-	-	-	
	BC 10/2009	0.005	-	-	-	-	-	0.01	-	-	[1][3]
	ON 7/2010	0.005	-	-	-	-	-	-	-	-	
	QC 6/2008	0.005	0.051	-	-	-	-	-	-	-	[3]
Polymethylenepolyphenyl isocyanate	AB 4/2009	0.005	0.07	-	-	-	-	-	-	-	
	BC 10/2009	0.005	-	-	-	-	-	0.01	-	-	
	ON 7/2010	0.005	-	-	-	-	-	0.02	-	-	
methylenediphenyl diisocyanate	BC 10/2009	0.005	-	-	-	-	-	0.01	-	-	
	ON 7/2010	0.005	-	-	-	-	-	0.02	-	-	

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

Mexico

Ingredient	Exposure limits
Diphenylmethane-4,4'-diisocyanate	**NOM-010-STPS (Mexico, 9/2000).** LMPE-PPT: 0.005 ppm 8 hour(s). LMPE-PPT: 0.051 mg/m³ 8 hour(s).

Consult local authorities for acceptable exposure limits.

8 . Exposure controls/personal protection

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. 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 : Liquid.

Flash point : Closed cup: >93.3°C (>199.9°F) [Setaflash.]

Color : Brown.

Odor : Faint odor.

Relative density : 1.14

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.

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.

Conditions to avoid : No specific data.

Materials to avoid : No specific data.

Incompatibility : Reactive or incompatible with the following materials: acids, alkalis and moisture.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11 . Toxicological information

United States

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Diphenylmethane-4,4'-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

Conclusion/Summary

Skin : May cause skin irritation. Contains isocyanates. May be harmful if absorbed through skin.

Eyes : This product may irritate eyes upon contact.

Respiratory : 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
Diphenylmethane-4,4'-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.

Canada

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Diphenylmethane-4,4'-diisocyanate	LD50 Oral	Rat	9200 mg/kg	-
Polymethylenepolyphenyl isocyanate	LD50 Dermal	Rabbit	>9400 mg/kg	-
	LD50 Oral	Rat	49 g/kg	-
	LC50 Inhalation Vapor	Rat	490 mg/m3	4 hours

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

Conclusion/Summary

Skin : May cause skin irritation. Contains isocyanates. May be harmful if absorbed through skin.

Eyes : This product may irritate eyes upon contact.

Respiratory : May cause respiratory irritation.

Sensitizer

11 . Toxicological information

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
Diphenylmethane-4,4'-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
Diphenylmethane-4,4'-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

Conclusion/Summary

Skin : May cause skin irritation. Contains isocyanates. May be harmful if absorbed through skin.

Eyes : This product may irritate eyes upon contact.

Respiratory : 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
Diphenylmethane-4,4'-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

Environmental effects : No known significant effects or critical hazards.

United States

Aquatic ecotoxicity

No known significant effects or critical hazards.

Biodegradability

No known significant effects or critical hazards.

Canada

Aquatic ecotoxicity

No known significant effects or critical hazards.

Biodegradability

No known significant effects or critical hazards.

Mexico

Aquatic ecotoxicity

No known significant effects or critical hazards.

Biodegradability

No known significant effects or critical hazards.

Other adverse effects : No known significant effects or critical hazards.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. 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. 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: methylenediphenyl diisocyanate; Diphenylmethane-4,4'-diisocyanate
TSCA 8(a) IUR: Polymethylenepolyphenyl isocyanate
United States inventory (TSCA 8b): All components are listed or exempted.
TSCA 8(c) calls for record of SAR: methylenediphenyl diisocyanate; Polymethylenepolyphenyl isocyanate; Diphenylmethane-4,4'-diisocyanate

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: Diphenylmethane-4,4'-diisocyanate
SARA 311/312 MSDS distribution - chemical inventory - hazard identification: Titebond Polyurethane Glue: Immediate (acute) health hazard, Delayed (chronic) health hazard

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 313

Form R - Reporting requirements :

Product name	CAS number	Concentration
Diphenylmethane-4,4'-diisocyanate	101-68-8	10 - 25
Polymethylenepolyphenyl isocyanate	9016-87-9	5 - 10

Supplier notification :

Product name	CAS number	Concentration
Diphenylmethane-4,4'-diisocyanate	101-68-8	10 - 25
Polymethylenepolyphenyl isocyanate	9016-87-9	5 - 10

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 Spill:** None of the components are listed.
Massachusetts Substances: The following components are listed: METHYLENE BISPHENYL ISOCYANATE (MDI)

New Jersey Hazardous Substances: The following components are listed: METHYLENE BISPHENYL ISOCYANATE; BENZENE, 1,1'-METHYLENEBIS[4-ISOCYANATO-; METHYLENE DIPHENYL DIISOCYANATE (POLYMERIC); ISOCYANIC ACID, POLYMETHYLENEPOLYPHENYLENE ESTER; DIISOCYANATES
New Jersey Spill: None of the components are listed.
New Jersey Toxic Catastrophe Prevention Act: None of the components are listed.

Pennsylvania RTK Hazardous Substances: 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 : **CEPA Toxic substances:** None of the components are listed.
Canadian ARET: None of the components are listed.
Canadian NPRI: The following components are listed: Methylenebis(phenylisocyanate); Polymeric diphenylmethane diisocyanate
Alberta Designated Substances: None of the components are listed.
Ontario Designated Substances: None of the components are listed.
Quebec Designated Substances: None of the components are listed.

Canada inventory : All components are listed or exempted.

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 :

15 . Regulatory information

International regulations

International lists : **Australia inventory (AICS):** All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: All components are listed or exempted.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

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. Contains isocyanates.

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

Health	*	2
Flammability		1
Physical hazards		0

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.

Date of printing : **10/22/2010.**

Date of issue : 10/21/2010.

Date of previous issue : 4/23/2009.

Version : 1

Indicates information that has changed from previously issued version.

Notice to reader

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.