

SAFETY DATA SHEET

Port & Surface 2/20 Part A

Section 1. Identification

GHS product Identifier : Port & Surface 2/20 Part A
Other means of identification : Not available

Relevant identified used of the substance or mixtures and uses advised against

Port & Surface 2/20 is a high-strength, two-part, room temperature curing adhesive system designed for use with urethane injection. It is used as an adhesive for surface port injection ports and to seal cracks

Supplier's details : Polyguard Products, Inc.
3801 South Interstate 45
Ennis, TX 75119
Tel: (800) 541-4994

Emergency telephone number) with hours of operation) : CHEMTREC, US 1-800-424-9300 International 1-703-527-3887
: (24/7)

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazardous Communications Standard (49CFR1910.1200) .

Classification of the substance or mixture : Acute toxicity: Inhalation- Category 4
Skin Corrosion/Irritation- Category 2
Serious Eye Damage/Eye Irritation- Category 2B.
Respiratory Sensitization- Category 1
Skin Sensitization- Category 1
Specific target organ toxicity (single exposure) (Respiratory Tract irritation – Category 3

GHS label elements
Hazard pictogram



Signal word : Danger
Hazard statement : Harmful if inhaled.
Causes skin and eye irritation
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause respiratory irritation.

Precautionary statements
Prevention

: Wear protective gloves and clothing. Wear eye or face protection. Where proper respiratory protection. Use only outdoors or in well ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the work place.

Section 2. Hazards identification

Response	: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. If experiencing respiratory symptoms: Call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. Discard contaminated shoes. If skin irritation or redness or burning sensation develop after washing: Get medical attention. IF IN EYES; Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Materials containing MDI may react with the moisture in the eye forming a thick material which might be difficult to wash from eyes. Get medical attention. If swallowed: rinse mouth with water. Do not induce vomiting. Seek medical attention.
Storage	: Store locked up. Store in a well-ventilated place. Keep cool.
Disposal	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified	: None known

Section 3. Composition/information on ingredients

Substance/Mixture	: Mixture
Other means of identification	: Not available

Ingredient name	%	CAS Number
4,4'-Methylenediphenyl diisocyanate Urethane Prepolymer	35	101-68-8
Talc	22-28	Trade secret
MDI Homopolymer	7-13	14807-96-6
Amorphous Silica	6-12	
Quartz	1-7	68611-44-9
	0.1	14808-60-7

Any concentration shown as a range is to protect confidentiality or is due to batch variation. Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures.

Eye contact	: In case of contact, immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention immediately. Materials containing MDI may react with the moisture of the eye forming a thick material that may be difficult to wash from the eyes.
Inhalation	: Move exposed person to fresh air. Get medical attention immediately. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is labored, oxygen should be administered by qualified personnel.
Skin contact	: After contact with skin, wash immediately with plenty of warm soapy water: Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention if redness, itching or a burning sensation develop or persists after the area has been washed. Wash clothing before reuse and discard contaminated shoes. Treat symptomatically as for contact dermatitis or thermal burns.
Ingestion	: Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Provided the patient is conscious, wash mouth out with water. Get medical attention.

Section 4. First aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact

: Causes eye irritation, inflammation and/or damage to sensitive eye tissue.

Inhalation

: Harmful if inhaled. May cause respiratory irritation. This product is a respiratory irritant and potential respiratory sensitizer: repeated inhalation of vapors or aerosol at levels above the occupational exposure limit could cause respiratory sensitization. Symptoms may include dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

Skin contact

: Causes skin irritation. May cause sensitization by skin contact. Skin contact may result in allergic skin reaction and respiratory sensitization.

Ingestion

: Single dose oral toxicity is extremely low, but ingestion may cause irritation of the gastrointestinal tract.

Over-exposure signs/symptoms

Eye contact

: Adverse symptoms may include the following:
Pain or irritation,
Watering,
Redness.

Inhalation

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

Skin contact

: Adverse symptoms may include the following:
Irritation
Redness

Ingestion

: No specific data

Indication of immediate medical attention and special treatment needed, if necessary.

Notes to physician:

: Symptomatically treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

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 the aid to give mouth to mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

: Use CO₂, water or dry powder.

Unsuitable extinguishing media

: Water may be used if no other option is available and then do so in copious amounts. Reactions between water and hot isocyanate may be vigorous. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water.

Specific hazards arising from the chemical

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

Hazardous thermal decomposition products

: Decomposition products may include the following materials: Carbon Monoxide, Carbon Dioxide, nitrogen oxides, hydrocarbons and HCN.

Section 5. Fire-fighting measures

- 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 a positive pressure mode. PVC boots, gloves, safety helmet and protective clothing should be worn.
- Remark** : Due to reaction with water producing CO₂ gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Containers may burst if overheated.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures.

- For non emergency personal** : 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 thru spilled material. Avoid breathing vapor or mist. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment(see section 8).
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel.
- Environmental precautions** : Avoid disposal 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).
- Methods and materials for containment and cleaning up** : The area should be vacuum cleaned to remove remaining dust particles completely. If the product is in its liquid form: Absorb spillages onto sand, earth or any suitable adsorbant material. Leave to react for the at least 30 minutes. Shovel into open- top drums for further decontamination. Wash spillage area with water. Test atmosphere for MDI vapors. Neutralize small spillages with decontaminant. Remove and dispose of residues. The compositions of liquid decontaminates are given in section 16. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling Protective measures

- Put on appropriate personal protective equipment (see Section 8). 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. Avoid exposure – obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on the skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in original container or an approved alternative made from compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities

: Store in accordance with local regulations. Keep container tightly closed in a cool, well ventilated place. Keep away from moisture. Due to reaction with water producing CO₂ gas, a hazardous build-up of pressure could result if contaminated containers are resealed. Do not reseal contaminated containers. Uncontaminated containers, free of moisture, may be resealed only after placing under a nitrogen blanket. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
4,4'-Methylenediphenyl diisocyanate	ACGIH TLV (United States, 3/2012) TWA: 0.005 ppm 8 hours OSHA PEL (United States, 6/2010) CEIL: 0.02 ppm CEIL: 30.2 mg/m ³

Appropriate engineering controls

: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Diisocyanates can only be smelled if occupational exposure limits have been exceeded considerably. Medical supervision of all employees who handle or come in contact with respiratory sensitizers is recommended. Personnel with a history of asthma-type conditions, bronchitis or skin sensitization conditions should not work with MDI based products. The Occupational Exposure Limits listed do not apply to previously sensitized individuals. Sensitized individuals should be removed from any further exposure.

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Hygiene measure:

: 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 work station.

Eye/face protection

: Chemical splash goggles or safety glasses or full face shield complying with an approved standard should be used when risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases and dusts. If vapor exposure causes eye discomfort, use a full face respirator with the proper cartridges or an air supplied respirator.

Section 8. Exposure controls/personal protection

Skin Protection

Hand protection

: Use chemical resistant gloves protective gloves that are impervious to MDI under conditions of use. Examples of gloves material that might prove suitable protection include: Butyl rubber, Polychloroprene (Neoprene*), Nitrile/butadiene rubber (“ nitrile” or “NBR”).

When prolonged or frequent repeated contact may occur, a glove with protection class 5 or higher (breakthrough time is greater than 240 minutes according to EN 374) is recommended. Contaminated gloves should be decontaminated and disposed of. Notice: The selection of a specific glove for a particular application and duration of use in the workplace should also take into account all requisite workplace factors such as but not limited to: other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove manufacturer. Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.

Body protection

: 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. Recommended: Overall made of Saranex coated Tyvek.

Other skin protection

: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

: Use a properly fitted, air purifying or supplied air 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.

Thermal hazards

: Not available

Section 9. Physical and chemical properties

Appearance

Physical state

: Liquid

Color

: Not available

Odor

: Mild

Odor threshold

: Not available

pH

: Not applicable

Melting point

: Not applicable

Boiling point

: 405°F (5 mm Hg)

Flash Point

: 398°F (PMCC)

Evaporation rate:

: Slower than ethyl ether

Flammability(solid, gas)

: Not determined

Lower & upper explosive (flammable) limits

: Not determined

Vapor density

: 1.5 (MDI) air=1

Vapor pressure

: < 10 mm Hg

Relative density

: 10.31 lbs/gal

Solubility

: MDI is insoluble in water, but will react slowly to liberate CO₂ gas.

Partition coefficient: n-octanol/water

: Not available

Auto- ignition temperature

: >600°C (>1112°F)

Decomposition temperature

: Not available

VOC

: Not available

Viscosity

: Not Available

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: Stable at room temperature.
Possibility of hazardous reactions	: Hazardous polymerization may occur with incompatible reactants especially strong bases, water or temperatures over 320° F. Reaction with water (moisture) produces CO ₂ – gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if miscibility of the reaction partners is good or is supported by the presence of solvents. MDI is insoluble with and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyuria is formed at the interface by liberating carbon dioxide gas.
Conditions to avoid:	: Avoid temperatures over 320° F, and contact with water, alcohols, amines, acid bases and metal compounds.
Incompatible materials	: Water, alcohols, amines, metal compounds, bases and acids.
Hazardous decomposition products	: Combustion products may include: Carbon oxides (CO, CO ₂), nitrogen oxides (NO, NO ₂ , etc.), hydrocarbons and HCN.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
4,4'-Methylenediphenyl diisocyanate	Acute Inhalation Toxicity	LC50 – 4 hrs.	Rat- Male, Female	369 mg/l
	Acute Inhalation Toxicity	LC50 – aerosol	Rat	> 2240 mg/m ³

Conclusion/Summary

4, 4'-Methylenediphenyl diisocyanate Irritating to the respiratory system.

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
4,4'-Methylenediphenyl diisocyanate	Acute Dermal toxicity	Rabbit	>10,000 mg/kg

Conclusions/Summary

Skin	: 4,4'-Methylenediphenyl diisocyanate	Irritating to the skin
Eyes	: 4,4'-Methylenediphenyl diisocyanate	Based on the human occupational exposure data, this substance is considered as irritating to eyes.
Respiratory	: 4,4'-Methylenediphenyl diisocyanate	As a result of previous repeated overexposure or a single large dose, certain individuals develop isocyanine sensitization (chemical asthma) or tissue injury in the upper respiratory tract.

Sensitization

Product/ingredient name	Test	Route of exposure	Species	Result
4,4'-Methylenediphenyl diisocyanate	Dermal Sensitization:	GPMT inhalation	Guinea pig	Sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitizing

Section 11. Toxicological information

Mutagenicity

Genetic toxicity in Vitro; Ames: (salmonella typhemurium, metabolic activation: with/without) Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing Mutagenicity results.

Conclusions/Summary

: 4,4'-Methylenediphenyl diisocyanate No Mutagenic effect

Carcinogenicity

4,4'-Methylenediphenyl diisocyanate :(Rat) female, inhalation, 2 years, 17 hrs./day , 5 days/week: negative

Carcinogenic class

Product/ingredient name	IARC	OSHA
4,4'-Methylenediphenyl diisocyanate	3	-

Reproductive Toxicity

Conclusions/Summary

: 4,4'-Methylenediphenyl diisocyanate No known significant effects or critical hazards

Teratogenicity

Conclusions/Summary

: 4,4'-Methylenediphenyl diisocyanate No known significant effects or critical hazards

Specific target organ toxicity(single exposure)

Not available

Specific target organ toxicity(repeated exposure)

Not available

Aspiration hazard

Not available

Information on the likely routes of exposure: : Skin ,eyes and respiratory tract

Potential acute health effects

Eye contact

Inhalation

: Causes eye irritation
 : Harmful if inhaled. May cause respiratory irritation. This product is a respiratory irritant and potential respiratory sensitizer: repeated inhalation of vapors or aerosol at levels above the occupational exposure limit could cause respiratory sensitization. Symptoms may include dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

Section 11. Toxicological information

Skin contact	: Causes skin irritation. May cause sensitization by skin contact. Animal studies have shown that respiratory sensitization can be induced by skin contact with known respiratory sensitizers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.
Ingestion	: Low oral toxicity, but ingestion may cause irritation of the gastrointestinal tract.
<u>Symptoms related to the physical, chemical and toxicological characteristics</u>	
Eye contact	: Adverse symptoms may include the following: Pain or irritation, Watering, Redness.
Inhalation	: Adverse symptoms may include the following: Respiratory tract irritation coughing wheezing and breathing difficulties asthma
Skin contact	: Adverse symptoms may include the following: Irritation Redness
Ingestion	: No specific data
<u>Delayed and immediate effects and also chronic effects from short and long term exposure</u>	
<u>Short term exposure</u>	
Potential immediate effects	: Not available
Potential delayed effects	: Not available
<u>Long term exposure</u>	
Potential immediate effects	: Not available
Potential delayed effects	: Not available
<u>Potential chronic health effects</u>	
General	: May cause damage to organs through prolonged or repeated exposure if inhaled. Once sensitized a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	: Lung tumors have been observed in laboratory animals exposed to aerosol droplets of MDI/Polymeric MDI (6 mg/m ³) for their life time. Tumors occurred concurrently with respiratory irritation and lung injury.
Mutagenicity	: No known significant effects or critical hazards
Teragenicity	: 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
<u>Numerical measures of toxicity</u>	

Section 12. Ecological information

<u>Toxicity</u> Product/ingredient name	Endpoint	Exposure	Species	Result
4,4'-Methylenediphenyl diisocyanate	Acute LC50	24 hrs.	Zebra fish (Brachydanio rerio)	> 500 mg/L
	Acute LC50	24 hrs.	Water flea (Daphnia magna)	> 500 mg/L

Persistence and degradability Conclusion/summary

4,4'-Methylenediphenyl diisocyanate Not biodegradable

Bioaccumulation potential

Product/ingredient name	Log P _{ow}	BCF	Potential
4,4'-Methylenediphenyl diisocyanate	4.51	200	low

Mobility in soil

Mobility

: By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise. Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino-diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In the air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

Other adverse effects

: No known significant effects or critical hazards.

Other ecological information

BOD5

: Not determined.

COD

: Not determined.

TOC

: Not determined.

Section 13. Disposal considerations

Disposal methods

: 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 product via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the regulations of environmental protection and waste disposal legislation and any regional local authority requirements. A void dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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

Section 14. Transport information

Proper shipping name

DOT/IATA/IMDG

: Not regulated

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

United States Regulations

TSCA 8(b) inventory

: All components are listed or exempted.

SARA 311/312

: Immediate (acute) health hazard, Delayed Health Hazard, reactive hazard.

SARA 313 Form R- Reporting requirements

Product name

4,4'-Methylenediphenyl diisocyanate

Concentrations %

100

CERCLA Hazardous Substance

<u>Ingredient name</u>	<u>%</u>
Diphenylmethane diisocyanate	100

Section 304

<u>CERCLA Hazardous Substance</u>	<u>CERCLA Reportable Quantity (Lbs)</u>	<u>Product Reportable Quantity (Lbs)</u>
Listed	5000	5000

State Regulations

California Prop 65

: This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Section 16. Other information

Hazardous Material Information System (USA)

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 SDSs under 29 CFR1910.1200, the preparer may choose to provide them. HMIS[®] ratings are to be used with fully implemented HMIS[®] program. HMIS[®] is a registered trademark of the National Paint & Coating Association (NPCA). HMIS[®] materials may be purchased exclusively from J.J. Keller.

Date of revision

: 5/29/15

Date of previous issue

: 8/13/13

Revisions:

: Revision to entire document for compliance of new HazCom rules.

Version

: 4

Prepared by

: C. Rogalski

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.

SAFETY DATA SHEET

Port & Surface 2/20 Part B

Section 1. Identification

GHS product Identifier : Port & Surface 2/20 Part B
Other means of identification : Not available

Relevant identified used of the substance or mixtures and uses advised against

Port & Surface 2/20 is a high-strength, two-part, room temperature curing adhesive system designed for use with urethane injection. It is used as an adhesive for surface port injection ports and to seal cracks.

Supplier's details : Polyguard Products, Inc.
3801 South Interstate 45
Ennis, TX 75119
Tel: (800) 541-4994

Emergency telephone number) with hours of operation) : CHEMTREC, US 1-800-424-9300 International 1-703-527-3887
: (24/7)

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OSHA/HCS status : This material is considered hazardous by the OSHA Hazardous Communications Standard (49CFR1910.1200) .

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Skin Corrosion/Irritation- Category 2
Serious Eye Damage/Eye Irritation- Category 2B.
Respiratory Sensitization- Category 1
Skin Sensitization- Category 1
Specific target organ toxicity (single exposure) (Respiratory Tract irritation – Category 3

GHS label elements
Hazard pictogram



Signal word : Danger
Hazard statement : Harmful if inhaled.
Causes skin and eye irritation
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.
May cause respiratory irritation.

Precautionary statements
Prevention

: Wear protective gloves and clothing. Wear eye or face protection. Where proper respiratory protection. Use only outdoors or in well ventilated area. Avoid breathing vapor. Wash hands thoroughly after handling. Contaminated work clothing should not be allowed out of the work place.

Section 2. Hazards identification

Response	: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a POISON CENTER or physician if you feel unwell. If experiencing respiratory symptoms: Call a POISON CENTER or physician. IF ON SKIN: Wash with plenty of soap and water. Take off contaminated clothing. Wash contaminated clothing before reuse. Discard contaminated shoes. If skin irritation or redness or burning sensation develop after washing: Get medical attention. IF IN EYES; Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Materials containing MDI may react with the moisture in the eye forming a thick material which might be difficult to wash from eyes. Get medical attention. If swallowed: rinse mouth with water. Do not induce vomiting. Seek medical attention.
Storage	: Store locked up. Store in a well-ventilated place. Keep cool.
Disposal	: Dispose of contents and container in accordance with all local, regional, national and international regulations.
Hazards not otherwise classified	: None known

Section 3. Composition/information on ingredients

Substance/Mixture	: Mixture
Other means of identification	: Not available

Ingredient name	%	CAS Number
4,4'-Methylenediphenyl diisocyanate Urethane Prepolymer	38-42	101-68-8
Talc	19-23	Trade Secret
Polyol	21-25	14807-96-6
Quartz	5-9	Trade Secret
Clay	0.1-2.2	14808-60-7
	1-5	Trade Secret

Any concentration shown as a range is to protect confidentiality or is due to batch variation. Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures.

Eye contact	: In case of contact, immediately flush eyes with plenty of water for at least 20 minutes. Get medical attention immediately. Materials containing MDI may react with the moisture of the eye forming a thick material that may be difficult to wash from the eyes.
Inhalation	: Move exposed person to fresh air. Get medical attention immediately. Treatment is symptomatic for primary irritation or bronchospasm. If breathing is labored, oxygen should be administered by qualified personnel.
Skin contact	: After contact with skin, wash immediately with plenty of warm soapy water: Remove contaminated clothing and shoes. Continue to rinse for at least 10 minutes. Get medical attention if redness, itching or a burning sensation develop or persists after the area has been washed. Wash clothing before reuse and discard contaminated shoes. Treat symptomatically as for contact dermatitis or thermal burns.
Ingestion	: Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Provided the patient is conscious, wash mouth out with water. Get medical attention.

Section 4. First aid measures

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact

: Causes eye irritation, inflammation and/or damage to sensitive eye tissue.

Inhalation

: Harmful if inhaled. May cause respiratory irritation. This product is a respiratory irritant and potential respiratory sensitizer: repeated inhalation of vapors or aerosol at levels above the occupational exposure limit could cause respiratory sensitization. Symptoms may include dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

Skin contact

: Causes skin irritation. May cause sensitization by skin contact. Skin contact may result in allergic skin reaction and respiratory sensitization.

Ingestion

: Single dose oral toxicity is extremely low, but ingestion may cause irritation of the gastrointestinal tract.

Over-exposure signs/symptoms

Eye contact

: Adverse symptoms may include the following:
Pain or irritation,
Watering,
Redness.

Inhalation

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

Skin contact

: Adverse symptoms may include the following:
Irritation
Redness

Ingestion

: No specific data

Indication of immediate medical attention and special treatment needed, if necessary.

Notes to physician:

: Symptomatically treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

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 the aid to give mouth to mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media

: Use CO₂, water or dry powder.

Unsuitable extinguishing media

: Water may be used if no other option is available and then do so in copious amounts. Reactions between water and hot isocyanate may be vigorous. Prevent washings from entering water courses, keep fire exposed containers cool by spraying with water.

Specific hazards arising from the chemical

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

Hazardous thermal decomposition products

: Decomposition products may include the following materials: Carbon Monoxide, Carbon Dioxide, nitrogen oxides, hydrocarbons and HCN.

Section 5. Fire-fighting measures

- 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 a positive pressure mode. PVC boots, gloves, safety helmet and protective clothing should be worn.
- Remark** : Due to reaction with water producing CO₂ gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Containers may burst if overheated.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures.

- For non emergency personal** : 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 thru spilled material. Avoid breathing vapor or mist. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment(see section 8).
- For emergency responders** : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel.
- Environmental precautions** : Avoid disposal 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).
- Methods and materials for containment and cleaning up** : If the product is in its liquid form: Absorb spillages onto sand, earth or any suitable adsorbant material. Leave to react for the at least 30 minutes. Shovel into open- top drums for further decontamination. Wash spillage area with water. Test atmosphere for MDI vapors. Neutralize small spillages with decontaminant. Remove and dispose of residues. The compositions of liquid decontaminates are given in section 16. Note: see section 1 for emergency contact information and section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling Protective measures

- Precautions for safe handling** : Put on appropriate personal protective equipment (see Section 8). 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. Avoid exposure – obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes or on the skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in original container or an approved alternative made from compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous.
- Advice on general occupational hygiene** : Eating, drinking and smoking should be prohibited in areas where material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See section 8 for additional information on hygiene measures.

Section 7. Handling and storage

Conditions for safe storage, including any incompatibilities

: Store in accordance with local regulations. Keep container tightly closed in a cool, well ventilated place. Keep away from moisture. Due to reaction with water producing CO₂ gas, a hazardous build-up of pressure could result if contaminated containers are resealed. Do not reseal contaminated containers. Uncontaminated containers, free of moisture, may be resealed only after placing under a nitrogen blanket. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
4,4'-Methylenediphenyl diisocyanate	ACGIH TLV (United States, 3/2012) TWA: 0.005 ppm 8 hours OSHA PEL (United States, 6/2010) CEIL: 0.02 ppm CEIL: 30.2 mg/m ³

Appropriate engineering controls

: Use only with adequate ventilation. Use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. Diisocyanates can only be smelled if occupational exposure limits have been exceeded considerably. Medical supervision of all employees who handle or come in contact with respiratory sensitizers is recommended. Personnel with a history of asthma-type conditions, bronchitis or skin sensitization conditions should not work with MDI based products. The Occupational Exposure Limits listed do not apply to previously sensitized individuals. Sensitized individuals should be removed from any further exposure.

Environmental exposure controls

: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Hygiene measure:

: 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 work station.

Eye/face protection

: Chemical splash goggles or safety glasses or full face shield complying with an approved standard should be used when risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases and dusts. If vapor exposure causes eye discomfort, use a full face respirator with the proper cartridges or an air supplied respirator.

Section 8. Exposure controls/personal protection

Skin Protection

Hand protection

: Use chemical resistant gloves protective gloves that are impervious to MDI under conditions of use. Examples of gloves material that might prove suitable protection include: Butyl rubber, Polychloroprene (Neoprene*), Nitrile/butadiene rubber (“ nitrile” or”NBR”).

When prolonged or frequent repeated contact may occur, a glove with protection class 5 or higher (breakthrough time is greater than 240 minutes according to EN 374) is recommended. Contaminated gloves should be decontaminated and disposed of. Notice: The selection of a specific glove for a particular application and duration of use in the workplace should also take into account all requisite workplace factors such as but not limited to: other chemicals that may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), as well as instructions/specifications provided by the glove manufacturer. Protective gloves should be worn when handling freshly made polyurethane products to avoid contact with trace residual materials which may be hazardous in contact with skin.

Body protection

: 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. Recommended: Overall made of Saranex coated Tyvek.

Other skin protection

: Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection

: Use a properly fitted, air purifying or supplied air 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.

Thermal hazards

: Not available

Section 9. Physical and chemical properties

Appearance

Physical state

: Liquid

Color

: Dark gray

Odor

: Mild

Odor threshold

: Not available

pH

: Not applicable

Melting point

: Not applicable

Boiling point

: 405°F (5 mm Hg)

Flash Point

: > 398°F (PMCC)

Evaporation rate:

: Slower than ethyl ether

Flammability(solid, gas)

: Not determined

Lower & upper explosive (flammable) limits

: Not determined

Vapor density

: 1.5 (MDI) air=1

Vapor pressure

: < 10 mm Hg

Relative density

: 10.31 lbs/gal

Solubility

: MDI is insoluble in water, but will react slowly to liberate CO₂ gas.

Partition coefficient: n-octanol/water

: Not available

Auto- ignition temperature

: >600°C (>1112°F)

Decomposition temperature

: Not available

VOC

: Not available

Viscosity

: Not Available

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: Stable at room temperature.
Possibility of hazardous reactions	: Hazardous polymerization may occur with incompatible reactants especially strong bases, water or temperatures over 320° F. Reaction with water (moisture) produces CO ₂ – gas. Exothermic reaction with materials containing active hydrogen groups. The reaction becomes progressively more vigorous and can be violent at higher temperatures if miscibility of the reaction partners is good or is supported by the presence of solvents. MDI is insoluble with and heavier than water and sinks to the bottom but reacts slowly at the interface. A solid water-insoluble layer of polyurea is formed at the interface by liberating carbon dioxide gas.
Conditions to avoid:	: Avoid temperatures over 320° F, and contact with water, alcohols, amines, acid bases and metal compounds.
Incompatible materials	: Water, alcohols, amines, metal compounds, bases and acids.
Hazardous decomposition products	: Combustion products may include: Carbon oxides (CO, CO ₂), nitrogen oxides (NO, NO ₂ , etc.), hydrocarbons and HCN.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
4,4'-Methylenediphenyl diisocyanate	Acute Inhalation Toxicity	LC50 – 4 hrs.	Rat- Male, Female	369 mg/l
	Acute Inhalation Toxicity	LC50 – aerosol	Rat	> 2240 mg/m ³

Conclusion/Summary 4, 4'-Methylenediphenyl diisocyanate Irritating to the respiratory system.

Irritation/Corrosion

Product/ingredient name	Test	Species	Result
4,4'-Methylenediphenyl diisocyanate	Acute Dermal toxicity	Rabbit	>10,000 mg/kg

Conclusions/Summary

Skin	: 4,4'-Methylenediphenyl diisocyanate	Irritating to the skin
Eyes	: 4,4'-Methylenediphenyl diisocyanate	Based on the human occupational exposure data, this substance is considered as irritating to eyes.
Respiratory	: 4,4'-Methylenediphenyl diisocyanate	As a result of previous repeated overexposure or a single large dose, certain individuals develop isocyanine sensitization (chemical asthma) or tissue injury in the upper respiratory tract.

Sensitization

Product/ingredient name	Test	Route of exposure	Species	Result
4,4'-Methylenediphenyl diisocyanate	Dermal Sensitization:	GPMT inhalation	Guinea pig	Sensitizing
	No official guidelines	Respiratory	Guinea pig	Sensitizing

Section 11. Toxicological information

Mutagenicity

Genetic toxicity in Vitro; Ames: (salmonella typhemurium, metabolic activation: with/without) Positive and negative results were reported. The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing Mutagenicity results.

Conclusions/Summary

: 4,4'-Methylenediphenyl diisocyanate No Mutagenic effect

Carcinogenicity

4,4'-Methylenediphenyl diisocyanate :(Rat) female, inhalation, 2 years, 17 hrs./day , 5 days/week: negative

Carcinogenic class

Product/ingredient name	IARC	OSHA
4,4'-Methylenediphenyl diisocyanate	3	-

Reproductive Toxicity

Conclusions/Summary

: 4,4'-Methylenediphenyl diisocyanate

No known significant effects or critical hazards

Teratogenicity

Conclusions/Summary

: 4,4'-Methylenediphenyl diisocyanate

No known significant effects or critical hazards

Specific target organ toxicity(single exposure)

Not available

Specific target organ toxicity(repeated exposure)

Not available

Aspiration hazard

Not available

Information on the likely routes of exposure: : Skin ,eyes and respiratory tract

Potential acute health effects

Eye contact

: Causes eye irritation

Inhalation

: Harmful if inhaled. May cause respiratory irritation. This product is a respiratory irritant and potential respiratory sensitizer: repeated inhalation of vapors or aerosol at levels above the occupational exposure limit could cause respiratory sensitization. Symptoms may include dryness of the throat, tightness of chest and difficulty in breathing. The onset of the respiratory symptoms may be delayed for several hours after exposure. A hyper-reactive response to even minimal concentrations of MDI may develop in sensitized persons.

Section 11. Toxicological information

Skin contact	: Causes skin irritation. May cause sensitization by skin contact. Animal studies have shown that respiratory sensitization can be induced by skin contact with known respiratory sensitizers including diisocyanates. These results emphasize the need for protective clothing including gloves to be worn at all times when handling these chemicals or in maintenance work.
Ingestion	: Low oral toxicity, but ingestion may cause irritation of the gastrointestinal tract.
<u>Symptoms related to the physical, chemical and toxicological characteristics</u>	
Eye contact	: Adverse symptoms may include the following: Pain or irritation, Watering, Redness.
Inhalation	: Adverse symptoms may include the following: Respiratory tract irritation coughing wheezing and breathing difficulties asthma
Skin contact	: Adverse symptoms may include the following: Irritation Redness
Ingestion	: No specific data
<u>Delayed and immediate effects and also chronic effects from short and long term exposure</u>	
<u>Short term exposure</u>	
Potential immediate effects	: Not available
Potential delayed effects	: Not available
<u>Long term exposure</u>	
Potential immediate effects	: Not available
Potential delayed effects	: Not available
<u>Potential chronic health effects</u>	
General	: May cause damage to organs through prolonged or repeated exposure if inhaled. Once sensitized a severe allergic reaction may occur when subsequently exposed to very low levels.
Carcinogenicity	: Lung tumors have been observed in laboratory animals exposed to aerosol droplets of MDI/Polymeric MDI (6 mg/m ³) for their life time. Tumors occurred concurrently with respiratory irritation and lung injury.
Mutagenicity	: No known significant effects or critical hazards
Teragenicity	: 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
<u>Numerical measures of toxicity</u>	

Section 12. Ecological information

<u>Toxicity</u> Product/ingredient name	Endpoint	Exposure	Species	Result
4,4'-Methylenediphenyl diisocyanate	Acute LC50	24 hrs.	Zebra fish (Brachydanio rerio)	> 500 mg/L
	Acute LC50	24 hrs.	Water flea (Daphnia magna)	> 500 mg/L

Persistence and degradability Conclusion/summary

4,4'-Methylenediphenyl diisocyanate Not biodegradable

Bioaccumulation potential

Product/ingredient name	Log P _{ow}	BCF	Potential
4,4'-Methylenediphenyl diisocyanate	4.51	200	low

Mobility in soil

Mobility

: By considering the production and use of the substance, it is unlikely that significant environmental exposure in the air or water will arise. Immiscible with water, but will react with water to produce inert and non-biodegradable solids. Conversion to soluble products, including diamino-diphenylmethane (MDA), is very low under the optimal laboratory conditions of good dispersion and low concentration. In the air, the predominant degradation process is predicted to be a relatively rapid OH radical attack, by calculation and by analogy with related diisocyanates.

Other adverse effects

: No known significant effects or critical hazards.

Other ecological information

BOD5 : Not determined.
COD : Not determined.
TOC : Not determined.

Section 13. Disposal considerations

Disposal methods

: 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 product via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the regulations of environmental protection and waste disposal legislation and any regional local authority requirements. A void dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

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

Section 14. Transport information

Proper shipping name

DOT/IATA/IMDG : Not regulated

Section 15. Regulatory information

Safety, health and environmental regulations specific for the product

United States Regulations

TSCA 8(b) inventory
SARA 311/312

: All components are listed or exempted.
: Immediate (acute) health hazard, Delayed Health Hazard, reactive hazard.

SARA 313 Form R- Reporting requirements

Product name

4,4'-Methylenediphenyl diisocyanate

Concentrations %

100

CERCLA Hazardous Substance

Ingredient name %
Diphenylmethane 100
diisocyanate

Section 304

CERCLA Hazardous Substance

Listed

CERCLA Reportable Quantity (Lbs)

5000

Product Reportable Quantity (Lbs)

5000

State Regulations

California Prop 65

: This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Section 16. Other information

Hazardous Material Information System (USA)

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 SDSs under 29 CFR1910.1200, the preparer may choose to provide them. HMIS[®] ratings are to be used with fully implemented HMIS[®] program. HMIS[®] is a registered trademark of the National Paint & Coating Association (NPCA). HMIS[®] materials may be purchased exclusively from J.J. Keller.

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