Material Safety Data Sheet

Henkel Technologies

Revision Date: 07/27/2005 **Issue date:** 09/16/2005

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: Pipe Repair Kit
Product type: Polyurethane adhesive
Company address:
Henkel Corporation
1001 Trout Brook Crossing
Rocky Hill, Connecticut 06067

Item No. : 96321_TAPE
Region: United States
Contact Information:
Telephone: 860.571.5100
Emergency telephone: 860.571.5100
Internet: www.loctite.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous components	%	ACGIH TLV	OSHA PEL	OTHER
Homologues of methylene bisphenyl isocyanate 9016-87-9	5-10	None	None	None
Methylene bisphenyl isocyanate 101-68-8	1-5	0.005 ppm TWA	0.02 ppm Ceiling 0.2 mg/m³ Ceiling	None

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

HMIS:

Physical state: Fiberglass cloth coated with viscous white resin
Color: White
Odor: Odorless

HEALTH: 3
FLAMMABILITY: 1
PHYSICAL HAZARD: 1
Personal Protection: See Section 8

WARNING: MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTION.
MAY CAUSE EYE, SKIN AND RESPIRATORY TRACT IRRITATION.

Relevant routes of exposure: Skin contact, Eye contact from liquid, aerosols or vapor, Inhalation, Ingestion

Potential Health Effects

Inhalation:

Acute: Methylene bisphenyl isocyanate (MDI) vapors or mist at concentrations above the TLV can irritate the mucous membranes in the respiratory tract (nose, throat, lungs) causing runny nose, sore throat, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Persons with preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV with similar symptoms as well as lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). Chemical or hypersensitive pneumonitis with flu-like symptoms (e.g. fever, chills) have also been reported. These symptoms can be delayed up to several hours after exposure. Chronic: As a result of previous repeated exposures or a single large dose, certain individuals develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanate at levels well below the TLV. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthma attack, could be immediate or delayed (up to several hours after exposure). Similar to many non-specific asthmatic responses, there are reports that once sensitized an individual can experience these symptoms upon exposure to dust, cold air, or other irritants. This increased lung sensitivity can persist for weeks and in severe cases for several years. Over exposure to isocyanates has also been reported to cause lung damage (including decrease in lung function) which may be permanent. Sensitization can either be temporary or permanent.

Skin contact:	Acute: Isocyanates react with skin protein and moisture and can cause irritation which may include the following symptoms: reddening, swelling, rash, scaling or blistering. Cured material is difficult to remove. Chronic: Prolonged contact can cause reddening, swelling, rash, scaling, blistering and in some cases, skin sensitization. Individuals who have skin sensitization can develop these symptoms from contact with liquid or vapor. Animal tests have indicated that respiratory sensitization can result from skin contact with MDI. These data reinforce the need to prevent direct skin contact with MDI.
Eye contact:	Liquid, aerosols or vapor are irritating and can cause tearing, reddening and swelling. If left untreated, corneal damage can occur and injury is slow to heal. Damage however is usually reversible. See Section 4 for First Aid measures.
Ingestion:	Irritation and corrosive action can occur in the mouth, stomach tissue and digestive tract if swallowed. Symptoms can include sore throat, abdominal pain, nausea, vomiting and diarrhea.
Existing conditions aggravated by exposure:	Asthma. Other respiratory disorders (bronchitis, emphysema, bronchial hyperreactivity). Skin allergies. Eczema.

See Section 11 for additional toxicological information.

4. FIRST AID MEASURES

Inhalation:	Move to an area free from risk of further exposure. Administer oxygen or artificial respiration as needed. Obtain medical attention. Asthmatic-type symptoms may develop and may be immediate or delayed up to several hours. Consult a physician should this development occur.
Skin contact:	Remove contaminated clothing and shoes. After contact with skin, wash immediately with plenty of water. Wash clothing before reuse. For severe exposures, get under safety shower after removing clothing, then get medical attention. For lesser exposure, seek medical attention if irritation develops or persists after area is washed.
Eye contact:	Flush with copious amounts of water, preferably, lukewarm water for at least 15 minutes, holding eyelids open all the time. Get medical attention.
Ingestion:	Do not induce vomiting. Drink 1 or 2 glasses of water. Never give anything by mouth to an unconscious person. Consult a physician if necessary.
Notes to physician:	Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors have produced reversible corneal epithelial edema impairing vision. Skin: This compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burns. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound. Respiratory: This compound is a known pulmonary sensitizer. Treat symptomatically and supportively.

5. FIRE-FIGHTING MEASURES

Flash point:	187.8°C (307°F) Pensky Martens closed cup
Autoignition temperature:	Not available
Flammable/Explosive limits-lower %:	Not available
Flammable/Explosive limits-upper %:	Not available
Extinguishing media:	Carbon dioxide (CO2). Foam. Dry chemical. Water spray.
Special fire fighting procedures:	Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear. During a fire, MDI vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. At temperatures above 204.4°C (400°F), polymeric MDI can polymerize and decompose which can cause pressure build-up in closed containers. Explosive rupture is possible. Therefore, use cold water to cool fire-exposed containers.
Unusual fire or explosion hazards:	None
Hazardous combustion products:	Oxides of nitrogen. Oxides of carbon. Hydrogen cyanide. Irritating organic vapors.

6. ACCIDENTAL RELEASE MEASURES

Environmental precautions: None known

Clean-up methods: Evacuate and ventilate spill area; dike spill to prevent entry into water system; wear full protective equipment during clean-up. If temporary control of isocyanate vapor is required, a blanket of protein foam (available at most fire departments) may be placed over spill. Large quantities may be pumped into closed, but not sealed containers for disposal. For minor spills, absorb isocyanates with sawdust or other absorbent, shovel into suitable unsealed containers, transport to well ventilated area (outside) and treat with neutralizing solution: mixture of 80% water and 20% non-ionic surfactant Tergitol TMN-10; or 90% water, 3-8% concentrated ammonia and 2% detergent. Add about ten parts of neutralizer per part of isocyanate, with mixing. Allow to stand uncovered for 48 hours to let carbon dioxide escape. Decontaminate floor with decontamination solution letting stand for at least 15 minutes.

7. HANDLING AND STORAGE

Handling: Avoid contact with eyes, skin and clothing. Avoid breathing vapor and mist. Wash thoroughly after handling. Exposure to vapors of heated MDI can be extremely dangerous. Employee education and training in the safe use and handling of this compound are required under the OSHA Hazard Communication Standard.

Storage: For safe storage, store between 0°C (32°F) and 40°C (104°F). Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. If container is exposed to high heat (204.4 °C (400 °F)), it can be pressurized and possibly rupture. MDI reacts slowly with water to form carbon dioxide gas. This gas can cause sealed containers to expand and possibly rupture.

Incompatible products: Water, amines, strong bases, and alcohols. Will cause some corrosion of copper alloys and aluminum.

For information on product shelf life contact Henkel Customer Service at (800) 243-4874.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls: Local exhaust should be used to maintain levels below the TLV whenever MDI is processed, heated or spray applied. Standard reference sources regarding industrial ventilation (i.e., ACGIH Industrial Ventilation) should be consulted for guidance about adequate ventilation. Air monitoring: Isocyanate exposure levels must be monitored. Monitoring of airborne isocyanates in the breathing zone of individuals should become part of the overall employee exposure characterization program. Monitoring techniques have been developed by NIOSH and OSHA. Medical Surveillance: Medical supervision of all employees who handle or come in contact with isocyanates is recommended. These should include preemployment and periodic medical examinations with pulmonary function tests (FEV, FVC as a minimum). Persons with asthmatic-type conditions, chronic bronchitis, other chronic respiratory diseases or recurrent skin eczema or sensitization should be excluded from working with isocyanates. Once a person is diagnosed as sensitized to an isocyanate, no further exposure can be permitted.

Respiratory protection: Concentrations greater than the TLV can occur when MDI is sprayed, heated or used in a poorly ventilated area. In such cases, or whenever concentrations of MDI exceed the TLV, respiratory protection must be worn. A positive pressure, supplied-air respirator or a self-contained breathing apparatus is recommended. In situations where MDI is not sprayed, heated, or used in a poorly ventilated area, and a supplied-air or self-contained breathing apparatus is unavailable or its use impractical, at least an air-purifying cartridge and particulate pre-filters must be worn. However, this should be permitted only for short periods of time (less than one hour) at relatively low concentrations (at or near the TLV). However, due to the poor warning properties of MDI, proper fit and timely replacement of filter elements must be ensured. Observe OSHA regulations for respiratory use (29 CFR 1910.134).

Skin protection: Permeation resistant gloves (butyl rubber, nitrile rubber, polyvinyl alcohol). However, please note that polyvinyl alcohol degrades in water. Cover as much of the exposed skin area as possible with appropriate clothing. If skin creams are used, keep the area covered by the cream to a minimum. Safety showers and eye wash stations should be available. Educate and train employees in safe use of product. Follow all label instructions.

Eye/face protection: Liquid chemical goggles. Vapor resistant goggles should be worn when contact lenses are in use. In a splash hazard environment, chemical goggles should be used in combination with a full face shield.

See Section 2 for exposure limits.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state: Fiberglass cloth coated with viscous white resin
Color: White

Odor:	Odorless
Vapor pressure:	0.003 mmHg @20°C (68° F)
pH:	Not applicable
Boiling point/range:	648.9°C (1200°F)
Melting point/range:	Not available
Specific gravity:	1.22
Vapor density:	8.5
Evaporation rate:	Not available
Solubility in water:	Insoluble Reacts slowly with water to liberate carbon dioxide gas.
Partition coefficient (n-octanol/water):	Not available
VOC content:	Not available

10. STABILITY AND REACTIVITY

Stability: Stable.

Hazardous polymerization: May occur. Contact with moisture, other materials which can react with isocyanates, or temperatures above 204.4°C (400°F), may cause polymerization.

Hazardous decomposition products: None

Incompatability: Water. Amines. Strong bases. Alcohols. Will cause some corrosion to copper alloys and aluminum.

Conditions to avoid: Contamination with water.

11. TOXICOLOGICAL INFORMATION

Product toxicity data: Toxicity data for monomeric and polymeric methylene bisphenyl isocyanate: Oral LD50: More than 15,800 mg/kg (Rats). Dermal LD50: More than 7,900 mg/kg (Rabbits). Inhalation LC50: Approximately 370-490 mg/m³ for an aerosol of polymeric MDI (Rats 4 hours). A two hour LC50 of greater than 400 mg/m³ was determined on a dust of monomeric MDI (Rats). Eye effects - slightly irritating. A maximum primary eye irritation score for a polymeric MDI of 12.0/110 (24 hours) was obtained. This score is fairly typical for a number of MDI products. Skin effects - Sight to moderate irritant. Primary dermal irritation scores are typically below 3.4/8.0 (Draize). Sensitization - MDI has been shown to produce dermal sensitization in several species (guinea pigs, mice, rabbits, and dogs). Intradermal or topical application followed by inhalation challenge have resulted in a respiration sensitization response in guinea pigs. In addition there is some evidence to suggest that cross-sensitization between different types of diisocyanates may occur. Chronic toxicity - In a chronic inhalation study, rats were exposed to an aerosol of polymeric MDI for six hours per day, five days per week for a period of two years. The exposure concentrations were 0, 0.2, 1.0 and 6.0 mg/m³. The No Observable Effects Level (NOEL) was 0.2 mg/m³. Carcinogenicity - In the same two year study described in "chronic toxicity" above, the occurence of pulmonary adenomas (benign tumors) and a single pulmonary adenocarcinoma (malignant tumor) was considered to be related to exposure. These tumors were observed ony in rats exposed to the high concentration of 6.0 mg/m³. Mutagenicity - Monomeric MDI is positive in the Ames assay (with hepatic microsomal activation). However, it was negative in an invivo-invitro micronucleous assay. MDI has been reported by NIOSH to be mutagenic to samonella typhemurium bacteria in presence of a mammalian activating system. Recent work done by M. Anderson, at the Danish School of Pharmacy in Denmark and published in the Scandanavian Journal of Work and Environmental Health, also shows a positive result. There is not full agreement in the scientific community on the significance of these Ames test results and their relationship to human safety in the risk of cancer in man. Other toxicity data - No conclusive evidence has been developed to indicate that either MDI or a similar product (a solution of MDI and a polyisocyanate prepolymer based on MDI) is carcinogenic, teratogenic or that it causes reproductive effects in animals or in humans.

Carcinogen Status

Hazardous components	NTP Carcinogen	IARC Carcinogen	OSHA Carcinogen
Homologues of methylene bisphenyl isocyanate 9016-87-9	No	No	No
Methylene bisphenyl isocyanate 101-68-8	No	No	No

Literature Referenced Target Organ & Other Health Effects

Hazardous components	Health Effects/Target Organs
Homologues of methylene bisphenyl isocyanate 9016-87-9	Allergen, Irritant, Kidney, Liver, Respiratory
Methylene bisphenyl isocyanate 101-68-8	Allergen, Irritant, Respiratory

12. ECOLOGICAL INFORMATION

Ecological information: For both polymeric and monomeric MDI: Aquatic toxicity - LC50 - 24 hour (static): greater than 500 mg/l for Daphnia magna, Limnea stagnalis, and Zebra fish (Brachydanio rerio).

13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Dispose according to EPA and local governmental regulations.

EPA hazardous waste number: Not a RCRA hazardous waste.

14. TRANSPORT INFORMATION

U.S. Department of Transportation Ground (49 CFR):

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

International Air Transportation (ICAO/IATA):

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None

WaterTransportation (IMO/IMDG):

Proper shipping name: Not regulated
Hazard class or division: None
Identification number: None
Packing group: None
Marine pollutant: None

15. REGULATORY INFORMATION

United States Regulatory Information

TSCA 8 (b) Inventory Status: All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification: None.

CERCLA/SARA Section 302 EHS: None.
CERCLA/SARA Section 311/312: Immediate Health Hazard, Delayed Health Hazard, Reactive
CERCLA/SARA 313: This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Methylene bisphenyl isocyanate (CAS# 9016-87-9). Methylene bisphenyl isocyanate (CAS# 101-68-8).

California Proposition 65: No California Proposition 65 listed chemicals are known to be present.

Canada Regulatory Information

CEPA DSL/NDSL Status: All components are listed on or are exempt from listing on the Domestic Substances List.
WHMIS hazard class: D.2.A, D.2.B

16. OTHER INFORMATION

This material safety data sheet contains changes from the previous version in sections: New Material Safety Data Sheet format.

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