MATERIAL SAFETY DATA SHEET

 Date: 11/10/2013

Not classified as Hazardous according to criteria of work safe Australia

NEXUS 560 PART B
2 PART POLYURETHANE ADHESIVE

Version 1, 11/10/2013

1. Substance/preparation and company identification

NEXUS 560 PART B of 2 PART POLYURETHANE ADHESIVE

Company:
Nexus Adhesives Pty Ltd
42 Healey Road, Dandenong South.
Victoria 3175 Australia
Telephone: +61 3 9706 4022
Telefax number: +61 3 9706 4122

Emergency information:
0417 489 877 [within Australia]
Australian Poisons Information Centre: 131 126

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2. Hazard identification

Hazard Category: Hazardous according to the criteria of National Health and Safety Commission, Australia **(NHSCA)**

If inhaled:
ACUTE EXPOSURE: MDI vapour or mist at concentration above the TLV can irritate (burning sensation) the mucous membrane in the respiratory tract (nose, throat, lungs) causing runny nose, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Individuals with a pre-existing, non-specific bronchial hyper reactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitivity pneumonitis, with flu like symptoms (e.g. fever chills) has also been reported. These symptoms can be delayed up to several hours after exposure.
CHRONIC EXPOSURE: As a result of previous repeated overexposure or a single large overdose, certain individuals develop isocyanate sensitization (chemical asthma) which will cause them to react to a later isocyanate exposure at levels well below TLV. These symptoms which can include chest tightness, wheezing, cough, shortness of breath or asthmas 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. Overexposure to isocyanates has also been reported to cause lung damage (including decreased lung function) which may be permanent. Sensitization can either be temporary or permanent.

On skin contact:
ACUTE EXPOSURE: 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 EXPOSURE: Prolonged contact can cause reddening, swelling, rash, scaling, blistering, and in some cases skin sensitization. Individuals who have developed skin sensitization can develop these symptoms as a result of contact with very small amounts of liquid material or as a result of exposure to vapour.

On contact with eyes:
ACUTE EXPOSURE: Liquid, aerosols or vapors are irritating and can cause tearing, reddening and swelling. If left untreated, corneal damage can occur and injury is slow to heal. However damage is usually reversible. (See section VI for treatment)
CHRONIC EXPOSURE: None found.

On ingestion:
ACUTE EXPOSURE: Can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, vomiting and diarrhea.
CHRONIC EXPOSURE: None found.

HMIS- RATINGS (scale 0 -4) Health=2, Fire=1, Physical Hazard=1
NFPA- RATING (scale 0 – 4) Health=2, Fire=1, Reactivity= 1.

Special health & environment warning

R36/37/38	Irritating to eyes, respiratory system & skin.
R42/43	May cause sensitization by inhaling & skin contact.

This product contains isocyanates.

3. Composition/information on ingredients

Chemical Product	%content	CAS NR.
Isocyanic acid, polymethylenepolyphenyle	30 – 40%	9016879
4-4' Methylenediphenyl diisocyanate	25 – 35%	101-68-8
Benzene,1,1-methylenebis(isocyanato-	25 – 35%	26447405
Phenyl isocyanate	<0.5%	103719

4. First-aid measures

Inhalation: Move Victim away from contaminated area into fresh air. Administer oxygen or artificial respiration as needed. Obtain medical attention. Asthmatic – type symptoms may develop and may be immediate or delayed upto several hours. Consult a physician should this occur.
Skin Contact: Remove contaminated clothing. Wash affected area thoroughly with soap and water. Wash contaminated clothing thoroughly before reuse. For severe exposure get under safety shower after removing clothing, and then seek medical attention. For lesser exposure, seek medical attention if irritation develops or persists after the area is washed.
EYE CONTACT: Flush with copious amounts of lukewarm water for 15 mins, holding eye lids open at all times. Refer individual to physician or ophthalmologist for immediate follow up.
INGESTION: Do not induce vomiting. Give 1 to 2 cups of milk or water to drink. DO NOT GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. Get prompt, qualified medical help.
Note to Physician
Skin: This compound is a known skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burns. If burned, treat as thermal burn.

EYES: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic steroid preparation frequently. Workplace vapors may produce reversible corneal epithelial edema impairing vision.

RESPIRATORY: This compound is a known pulmonary sensitizer. Treatment is essentially symptomatic. An individual having a skin or pulmonary sensitization reaction to this material should be removed from exposure to any isocyanate.

INGESTION: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated because of the irritating nature of this compound.

5. Fire-fighting measures

Flash point:	234^{o} C (453^{o} F)
Flash Point Method:	Pensky- Martens Closed Cup (ASTM D-93)
Autoignition Temperature:	Not established
LEL:	N.A.
UEL:	N.A.

Dry chemical (e.g. monoammonium phosphate, potassium sulfate, and potassium chloride), carbon dioxide, high expansion (proteinic) chemical foam, water spray for large fires. Full emergency equipment with self contained breathing apparatus and full protective clothing should be worn by the fire fighters. During a fire, vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion. At temperatures greater than 204^{o} C, this product can be polymerised 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:
Large fires can be extinguished with large voulume of water applied from safe distance, since reaction between water and hot diisocyanate can be vigorous.

6. Accidental release measures

Cover spill with sawdust, vermiculite, Fullers earth or other absorbent material. Pour decontamination solution over spill area and allow to react for at least 10 mins. Collect material in open container and add further amount of decontamination solution. Remove containers to safe place, cover loosely, and allow to stand for 24 to 48 hours. Wash down area with decontamination solution.
Decontamination solution: non-ionic surfactant Union Carbides Tergitol TMN-10 (20%) and water (80%); concentrated ammonia (3 – 8%) detergent (2%) and water (90 – 95%).
Respiratory protection is recommended during spill clean-up.

7. Handling and storage

Handling

Avoid breathing vapors or mist. Avoid contact with eyes, skin or clothing. Do not expose containers to open flame, excessive heat, or direct sunlight.

Storage

Storage temperature should be between $+18^0$ to $+30^0$ C.
Store in tightly closed containers to prevent moisture contamination. This product reacts slowly with water to form CO_2 gas. This gas can cause sealed container to expand and possible rupture, Do not reseal if container is suspected.
Store in cool dry area.
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8. Exposure controls and personal protection

Engineering Controls:

Educate and train employees in safe use of this product. Follow all label instruction. Local exhaust should be used to maintain levels below the TLV whenever this product is processed, heated or spray applied. For spray application, an air-supplied respirator must be worn. All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94).

Personal protective equipment

Inhalation:
An air-supplied respirator must be worn during spray application, during long term (over 1 hr) exposure when the product is heated or in environment of high concentration near the TLV, an air-purifying respirator equipped with organic cartridges or canisters and dust filters can be used. However, due to poor warning properties od this product, proper fit and timely replacement of filter elements must be ensured. Observe OSHA regulations for respirator use (29 CFR 1910.134)

Skin protection:
Wear protective working clothes, boots, overall and gloves.
Permeability tests indicate the following materials as efficient for protective clothing, butyl rubber, neoprene, nitrile/butadiene rubber. Thin disposable gloves should not be used for long periods. Carefully wash with soap and water after work or before eating, drinking or smoking. Contaminated clothing should be washed or dry cleaned before reuse.

Eye protection:
Safety glasses with side-shields (frame goggles) (e.g. EN 166)

General safety and hygiene measures:
Hands and/or face should be washed before breaks and at the end of the shift. Avoid contact with skin and eyes.

ADDITIONAL PROTECTIVE MEASURES: Clean, fresh running water should be available.

EXPOSURE GUIDLINES: EXPOSURE LIMITS:

USA OSHA (TWA_5)/PEL):	**0.02 ppm**
NIOSH (TWA):	**0.005 ppm**
IDLH:	**75 mg/m^3**
NIOSH (C 10 min):	**0.02 ppm**

9. Physical and chemical properties

Form:	Clear brown liquid
Odour:	slightly musty
pH value:	n.a
Specific Gravity	about 1.24 @ 25^0 C
Vapour Pressure	< 0.0001 mmHg @25^0 C
Vapour Density:	8.5 (MDI)
Solubility in water (20^0)	reacts slowly with water to liberate CO_2 gas.
Boiling Point	208^0 C
Freezing/Melting Pt:(^{0}C)	< 0^0 C
V.O.C	0 g/L

10. Stability and reactivity

Chemical Stability	Product remains stable if handled and contained in recommended storage conditions
Conditions to Avoid:	Temperature less than 0 deg C. Avoid excess heat.

Reactivity: MDI base products reacts with many substances by generating heat, such as: chemical bases (e.g. caustic soda) ammonia, primary and secondary amine, alcohol, water and acids. MDI base products are insoluble in water and as they are denser than water, precipitate to the bottom, slowly reacting on the interface. The reaction forms a solid polyurea layer which is not soluble in water and which releases carbon dioxide.
Hazardous Decomposition products: By fire and high heat: Hydrogen cyanide; Carbon Dioxide, Carbon monoxide, oxides of nitrogen (NOx), dense black smoke, isocyanate, Isocyanic Acid, Other undetermined compounds.
Hazardous Polymerization: May occur in contact with moisture or other material which reacts with isocyanates. May occur at the temperature over 204 Deg C.

11. Toxicological information

Acute Eye Effects: Liquids, aersols or vapours are irritatin and can cause tearing, reddening and swelling. If left untreated, cornea damage can occur and injury is slow to heal. However damage is usually reversible. May cause sensitation
ACUTE SKIN EFFECTS: Skin sensitivity can be developed following prolonged and repeated contact. Isocyanates react with skin protein and moisture and can cause irruption

which may include the following symptoms: reddening, rash, scaling or blistering. Cured material is difficult to remove.

ACUTE INHALATION EFFECTS: Vapour or mist at concentration above the TLV can irritate (burning sensation) the mucous membrane in the respiratory tract (nose, throat, lungs) causing runny nose, coughing, chest discomfort, shortness of breath and reduced lung function (breathing obstruction). Individuals with a pre-existing, non-specific bronchial hyper reactivity can respond to concentrations below the TLV with similar symptoms as well as asthma attack. Exposure well above the TLV may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitivity pneumonitis, with flu like symptoms (e.g. fever chills) has also been reported. These symptoms can be delayed up to several hours after exposure.

ACUTE INGESTION EFFECTS: Can result in irritation and corrosive action in the mouth, stomach tissue and digestive tract. Symptoms can include sore throat, abdominal pain, vomiting and diarrhea.

CHRONIC EYE EXPOSURE: None found.

CHRONIC SKIN EFFECTS: Prolonged contact can cause reddening, swelling, rash, scaling, blistering, and in some cases skin sensitization. Individuals who have developed skin sensitization can develop these symptoms as a result of contact with very small amounts of liquid material or as a result of exposure to vapour.

CHRONIC INHALATION EXPOSURE: As a result of previous repeated overexposure or a single large overdose, certain individuals develop isocyanate sensitization (chemical asthma) which will cause them to react to a later isocyanate exposure at levels well below TLV. These symptoms which can include chest tightness, wheezing, cough, shortness of breath or asthmas 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. Overexposure to isocyanates has also been reported to cause lung damage (including decreased lung function) which may be permanent. Sensitization can either be temporary or permanent.

CHRONIC INGESTION EFFECTS: None found

Polymeric MDI:
Acute Oral Toxicity
LD50:. 2000 mg/kg (rat, Male/Female)

Acute Inhalation Toxicity
LC50: 490 mg/m3, vapour, 4 h (rat)

Repeated Dose Toxicity
90 Days, Inhalation: NOAEL: 1 mg/m3 (rat, male/female, 6hrs/day 5 day/week)
Irritation to lungs and nasal cavity.
2 yrs, inhalation: NOAEL: 0.2 mg/m3, (rat, male/female, 6hrs/day 5 days/week)
irritation to lungs and nasal cavity.
Mutagenicity
Genetic Toxicity in Vitro:

Bacterial- gene mutation assay: negative (salmonella typhimurium, Metabolic Activation: with/without)

Carcinogenicity

Rat,male/female, inhalation, 2 yrs, 6 hrs/day 5 days/week
Exposure to a level of 6 mg/m3 polymeric MDI was related to the ocurrence of lung tumors. This level is significantly over the TLV for MDI.
Developmental Toxicity/ Teratogenicity
Rat,female, inhalation, gestation days 6 – 15, 6 hrs/day, NOAEL (teratogenicity): 12 mg/m3, NOAEL (maternal): 4 mg/m3
No teratogenicity effects observed at doses tested. Fetotoxicity seen only with maternal toxicity.

4,4' - MDI

Acute Inhalation Toxicity

LC50: 369 mg/m3, 4 hrs (rat Male/female)
LC50:> 2240 mg/m3, aerosol, 1 hr (rat)

Acute dermal toxicity

LD50:> 10 000 mg/kg (rabbit)

Skin Irritation

Rabbit, Draize test, slightly irritating

Eye Irritation

Rabbit, Draize test, slightly irritating

Sensitization

Dermal: sensitizer (guinea pig, Maximisation Test (GPMT))
Inhalation: sensitizer (guinea pig)

Repeated Dose Toxicity:

90 Days, inhalation: NOAEL: 0.3 mg/m3, (rat, Male/ Female, 18 hrs/day, 5 days/week) irritation to lungs and nasal cavity.

Mutagenicity:

Genetic Toxicity in Vitro:
Ames: (Salmonella typhimurium, Metabolic Activation: with/without)
Positive and negative results were reported, The use of certain solvents which rapidly hydrolyze diisocyanates is suspected of producing the positive mutagenicity results.
Genetic Toxicity in Vivo:
Micronucleus Assay: negative (mouse)

Carcinogenicity

Rat, Female, inhalation, 2yrs, 17 hrs/day, 5 days/week
Negative.

12. Ecological information

Contain spills. Avoid contamination waterways.

Ecological Data for 2,4- MDI

Biodegradation
0%, Exposure time: 28 Days

Bioaccumulation:
Rainbow trout, Exposure time: 112 days, < 1 BCF
Does nor bioaccumulate

Acute and prolonged toxicity to fish
LC0:> 1 000 mg/l (Zebrs fish (Brachydanio rerio), 96 hrs)
LC0: > 3 000 mg/l (killfish (oryzias latipes), 96 hr)

Acute toxicity to aquatic invertebrates
EC50:> 1 000 mg/l (water flea (Daphnis magna), 24 hrs)

Toxicity to aquatic plants
NOEC: 1 640 mg/l, End point: growth (green algae (Scenedesmus subspicatus), 72 hrs.
Toxicity to microorganisms
EC50:> 100 mg/l, (Activated sludge microorganisms, 3 hrs)

Additional Ecotoxicological Remarks
Ecotoxicity data based on polymeric MDI

Ecological Data for 4,4'- MDI

Acute and prolonged toxicity to fish
LC50:> 500 mg/l (Zebrs fish (Brachydanio rerio), 24 hrs)

Acute toxicity to aquatic invertebrates
EC50:> 500 mg/l (water flea (Daphnis magna), 24 hrs)

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13. Disposal considerations

Disposal:
Observe national and local legal requirements
The generation of waste should if possible be avoided or minimized.
The recommended waste disposal method is by incineration in controlled and approved conditions, using suitable incineration especially designed for the disposal of dangerous chemical waste. DO NOT HEAT OR CUT EMPTY CONTAINERS WITH ELECTRIC OR GAS TORCH.

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14. Transport information

Domestic transport

When in individual containers of less than the product RQ, this material ships as NON-REGULATED.

Other regulated substances, liquid n.o.s.
(contains 4,4' – Diphenylmethane Diisocyanate (MDI)

Hazard Class :	Class 9
UN/NA Number :	NA 3082
PACKAGING GROUP :	PG III
LABEL :	Class 9
PLACARD :	Class 9
PRODUCT RQ :	2270 Kg

Marine transport: Not classified as a dangerous good under transport regulations
IMDG
N.ONU
SEA POLLUTION NOT CLASSIFIED AS DANGEROUS.
EXACT CHEMICAL NAME:
POLYURETHANE ADHESIVE.- (contains 4,4' – Diphenylmethane Diisocyanate (MDI)

Air transport Not classified as a dangerous good under transport regulations
ICAO/IATA
contains 4,4' – Diphenylmethane Diisocyanate (MDI)

15. Regulatory information

Product only to be used by professional applicators.

Packaging and Labeling

Xn Harmful.

SAFETY Phrases(s)

S3	Keep in a cool place
S24/25	Avoid skin and eye contact
S26	In case of contact with eyes, rinse immediately with plenty of water and consult a doctor
S23	Do not breathe gas/fumes/vapour/spray
S28	After contact with skin, rinse immediately with plenty of soap & water
S51	Use only in well ventilated area

RISK PHRASES

R36/37/38	Irritating to eyes, respiratory system & skin.
R42/43	Mat cause sensitation by inhalation and skin contact.

Other regulations

16. Other information

Any other intended applications should be discussed with the manufacturer.

Contact
Technical 0417 489 877
Sales 0448 395 091

Previous Versions

Version	Date	Sections Changed
1	11/10/2013	1, 16

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. The data do not describe the product's properties (product specification). Neither should any agreed property nor the suitability of the product for any specific purpose be deduced from the data contained in the safety data sheet. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.