SIGN•GRIP 3801™
ONE PART URETHANE ADHESIVE

Material Safety Data Sheet

Section 1 – Product Name and Manufacturer

Product Name: SG3801
Product Use: Polyurethane Adhesive
Effective Date: 1/25/05
Revision Date: 10/4/07

Sign Arts Products.
26081 Merit Circle
Suite 104
Laguna Hills, CA 92653
(949)716-4829 Fax: (949)716-4934

In an emergency, call CHEMTREC @ 800-424-9300

Section 2 – Hazardous Ingredients

CAS NO.	Hazardous Ingredients(s)	%(by wt.)	ACGIH TLV
	Prepolymer reaction products of MDI	30 – 60%	
101-68-8	4,4--Dipheny1methane Diisocyanate (MDI)	10 – 15%	0.005 PPM TWA
25686-28-6	Diphenylmetane Diisocyanate (MDI) Homopolymer	< 5%	Not Established
26447-40-5	Diphenylmethane Diisocyanate (2,2,2,4)	< 1%	Not Established
99-63-8	1,3-benzendicarbonyl dichloride	< 1%	Not Established
28553-12-0	Diisononylphthalate	< 1%	Not Established

Section 3 – Hazards Identification

Emergency Overview:

DANGER! Keep out of reach of children and animals, harmful or fatal if swallowed. If swallowed, even in small amounts, product will react to form expanding masses in the digestive tract which may result in damage to the digestive tract and/or intestinal obstructions. Seek medical attention immediately.

Contains 4,4'-Diphenylmethane Diisocyanate (4,4' MDI). Vapor, spray mist and thermal decomposition products are harmful. Can cause eye, skin or respiratory tract irritation and allergic skin reaction. Overexposure may cause lung damage and allergic respiratory reaction. Animal tests indicate skin contact alone may also lead to allergic respiratory reaction. These effects may be permanent.

Acute Health Hazards

Inhalation: Dissocyanate vapors or mist concentration abouve the TLV or PEL, 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 a preexisting, nonspecific bronchial hyperreactivity can respond to concentrations below the TLV or PEL with similar symptoms as well as asthma attack or ashtma-like symptoms. Effect may be delayed several hours. These effects are usually reversible.

Skin: Causes irritation with symptoms of reddening, itching, and swelling. Persons previously sensitized can experience allergic skin reaction with symptoms of reddening, itching, swelling and rash. Cured material is difficult to remove. Contact with MDI can cause discoloration.

Eye: Casuses irrittaion with symptoms of reddening, tearing, stinging, and swelling. May cause temporary corneal injury. Vapor or aerosol may cause irrittaion with symptoms of burning and tering.

Ingestion: If swallowed, even in small amounts, product will react to form expanding masses in the digestive tract which may result in damage to the digestive tract and/or intestinal obstructions. May cause irritation; Symptoms may include abdominal pain, nausea, vomiting, and diarrhea.

Chronic Health Hazards

Inhalation: As a result of previous repeated overexposures or a single large dose, certain individuals may develop sensitization to diisocyanates (asthma or asthma-like symptoms) that may cause them to react to a later exposure to diisocyanates at levels well below the TLV or PEL. These symptoms, which can include chest tightness, wheezing, cough, shortness of breath or asthmatic attack, could be immediate or delayed up to several hours after exposure. Extreme asthmatic reactions can be life treatening. 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. Sensitization can be permanent. Chronic oversexposure to diisocyanates has also beeen reported to cause lung damage (including fibrosis, decrease in lung function that may be permanent.

Skin: Prolonged contact can cause reddening, swelling, rash, and , in some cases, skin sensitization. Animal tests on MDI indicate skin contact alone may lead to an allergic respiratory reaction.

Eye: Prolonged exposure may cause conjuntivitis.

Section 4 – First Aid Measures

Inhalation Remove patient from exposure, keep warm and at rest. Obtain medical attention. Administer oxygen or artifical respiration as needed. Asthmatic symptoms may develop and may be innediate or delayed up to several hours. Extreme asthmatic reactions can be life threatening.

Skin Contact Remove contaminated clothing. Wash affected areas thoroughly with soap and water. If irritation, redness, or a burning sensation develops and persists, obtain medical advice. Contaminated clothing should be thoroughly cleaned before reuse. For sever expousres, immediately get under safety shower and begin rinsing.

Eye Contact

Immediately flush eyes with running water for a minimum of 15 minutes. Hold eyelids open during flushing. If irritation persists repeat flushing and obtain medical attention IMMEDIATELY.

Ingestion

Seek medical attention immediately. Induce vomiting only if directed by medical personnel. Provided the patient is conscious, wash out their mouth with water.

Note to Physicians

Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation as needed. Workplace vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compound is a skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inhalation: Treatment is essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed form further exposure to any diisocyante.

Section 5 – Fire Fighting Measures

Extinguishing Media: Dry chemical, carbon dioxide (CO2), foam, water spray for large fires.

Fire Fighting Protective Equipment: Fire fighters should wear NFPA compliant structural firefighting protective equipment, including self-contained breathing apparatus and NFPA compliant helmet, hood, boots and gloves. Avoid contact with product. Decontaminate equipment and protective clothing prior to reuse. During a fire, isocyanate vapors and other irritating, highly toxic gases may be generated by termal decomposition or combustion. Exposure to heated diisocyantes can be extrememly dangerous.

Fire and Explosion Hazards: Closed container may rupture under heat of fire or when contents are contaminated with water (CO2 is formed). Keep fire-exposed containers cool with a cool-water spray and reduce the risk of rupture. Apply water from a safe distance as the reaction between water and hot diisocyanate can be vigorous.

Section 6 – Accidental Release Measures

For major spills call Chemtrec (800-424-9300)

Spills, Leaks, or Releases: Clean up should only be performed by trained personnel. People dealing with major spillages should wear full protective clothing including respiratory protection. Evacuate the area. Prevent further leakage, spillage or entry into drains. Contain and absorb large spillages onto an inert, non□flammable adsorbent carrier (such as earth or sand). Shovel into open□top drums or plastic bags for further decontamination, if necessary. Apply lid loosely and allow containers to vent for 72 hours to let carbon dioxide (CO2) excape. Wash the spillage area clean with liquid decontaminant. Test atmosphere for MDI vapor. Test surface for contamination. Neutralize small spillages with decontaminant. Remove and dispose of residues. Notify applicable government authorities if release is reportable.

Decontamination:

Neutralizaton solutions:

1. Colorimetric Laboratories Inc. (CLI) decontamination solution.
2. A mixture of 75% water, 20% non-ionic surtactant (e.g. Poly-tergent SL-62, Tergitoal TMN-10) and 5 % n-propanol.
3. A mixture of 80% water, 20% non-ionic surtactant (e.g. Poly-tergent SL-62, Tergitoal TMN-10).
4. A mixture of 90% water, 3-8% ammonium hydroxide or concentrated ammonia, and 2% liquid detergent.

Use of Decontamination Solution: Apply and allow deactivation material to stand for at least 30 minutes before shoveling into drums. Do not tighten the bungs.

Section 7 – Handling and Storage

Storage Temperature: Ideal storage temperature is 16 30°C (60 86°F).

Storage Requirements: If material is stored at temperatures above 86 F, it will generate presure within the container from carbon dioxide gas. Prior to opening, carefully inspect the conainer. If the container is bulging, or there are any other indications of pressure within the container, do not open the container. Care should be taken whenever opening container in case of a pressure build up. Slow removal of bung closure or lid should safely remove pressure from a non-bulging drum. Observe safety precautions whenever opening a new container. Do not breathe vapors, mists or dusts. Use adequate ventilation to keep airborne isocyanate levels below the exposure limits. Wear respiratory protection if material is heated, sprayed, used in a confined space, or if the exposure limit is exceeded. Warning properties (irritation of the eyes, nose and throat or odor) are not adequate to prevent overexposure from inhalation. Wash thoroughly after handling. Do not breathe smoke and gases created by overheating or burning this material. Decomposition products can be highly toxic and irritating. Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected.

Other Information: Keep stocks of decontaminant (See Section 6) readily available.

Section 8 – Exposure Control and Personal Protection

Engineering Controls: Use local exhaust ventilation to maintain airborne concentrations below the TLV. Suitable respiratory equipment should be used in cases of insufficient ventilation or where operational procedures demand it. Follow guidelines in the ACGIH publication "Industrial Ventilation". Monitoring for airborne diisocyanate should become part of the overall employee exposure characterization program. NIOSH, OSHA and others have developed sampling and analytical methods.

Respiratory Protection: Airborne MDI concentrations greater than the ACGIH TLV-TWA (TLV) or OSHA PEL-C L)can occur in inadequately ventilated enviroments when MDI is sprayed, aerosolized, or heated. In such caes, respiratory protection must be worn. The type of respiratory protection selected must comply with the requrements set forth in OSHA's Respiratory Protection standard (29 CRF 1910.134). The type of respiratory protection available includes (1) an atmosphere-supplying respirator such as a self-contained breathing apparatus (SCBA) or a supplied air respirator (SAR) in the positive pressure of continuous flow mode, or (2) an air-purifying respirator (APR). If an APR is selected then (a) the cartridge must be equipped with an end-of-service life indicator (ESLI) certified by NIOSH, or (b) a change out schedule, based on objective information or data that will ensure that the cartridges are changed out before the end of their service life, must be developed and implemented. The basis for the change out schedule must be described in the written respirator propgram. Further, if an APR is selected, the airborne diisocyanate concentration must be no greater than 10 times the TLV or PEL, The recommended APR cartridge is an organic vapor/particulated filter combination cartridge (OV/P100).

Eye Protection: Chemical safety goggles. If there is a potential for splashing, use a full-face shield.

Skin Protection: The following protective materials are recommended. Gloves made of neoprene, nitrile butadiene rubber, butyl rubber. Thin disposable gloves should be avoided for repeated or long term use. Protective clothing should be selected to cover as much of the exposed skin area as possible with appropriate clothing to prevent skin contact.

Medical Surveillance: All applicants who are assigned to an isocyanate work area should undergo a pre-placment medical evaluation. A history of exzema or respiratory allergies such a hay fever, are possible reasons for medical exclusion from isocyanate areas. Applicants who have a history of adult asthma should be restricted from work with isocyanates. Applicants with a history of prior isocyanate sensitization should be excluded from further work with isocyanates. A comprehensive annual medical surveillance program should be instituted for all employees who are potentially exposed to diisocyanates. Once a worker has been diagmosed a sensitized to any isocyanate, no futher exposure can be permitted.

Section 9 – Chemical and Physical Properties

Appearance/Color:	Yellow - Amber
Odor:	Slightly Musty
Boiling Point:	150 C (302 F)
Melting/Freezing Point:	10-15 C (50-59 F)
Flash Point:	200 C (392 F) Closed Cup
Solubility in Water:	Insoluable - Reacts slowly with Water
Specific Gravity:	Not Established
Bulk Density:	Not Established
% Volatile by Volume:	Neglible
Vapor Pressure:	< 0.0001 mmHg at 77 F (25 C)

Section 10 – Stability and Reactivity

Hazardous Reactions: Exposure to temperatures in excess of 158 F (70 C) may cause dangerous pressure build-up, resulting in the deformation and/or rupture of sealed containers. MDI reacts slowly with water to form CO2 gas. This gas can cause sealed containers to expand and possibly rupture. Contact with moisture, other materials that react with isocyantes, or temperatures above 350 F (177 C), may cause polymerization.

Materials to Avoid: Water, Amines, Strong bases, Alcohols, copper alloys, Aluminum

Hazardous Decomposition Products: By first and high heat: hydrogen cyanide; carbon dioxide (CO2), oxides of nitrogen (NOx), dense black smoke, isocyante, isocyanic acid, other undetermined compounds

Section 11 – Toxicological Information

This product has not been tested as a whole. Information for components from available sources is listed below.

Toxicity data Polymeric MDI
Oral LD50: > 2,000 mg/kg (rat, Male/Female)
Dermal LD50: No Data
Inhalation LC50 (rat): 490 mg/m3 vapor, 4 h

Skin Irritation: rabbit, slightly irritating

Repeated Dose Toxicity:
90 days, inhalation: NOAEL: 1 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lungs and nasal cavity.

2 years, inhalation: NOAEL: 0.2 mg/m3, (rat, Male/Female, 6 hrs/day 5 days/week)
Irritation to lung and nasal cavity.

Mutagenicity: Genetic Toxicity in Vitro: Bacterial – gene mutation assay: negative

Carcinogenicity: rat, Male/Female, inhalation, 2 years. 6 hrs.day, 5 days/week
Exposure to a level of 6mg/m3 polymeric MDI was related to the occurrence 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): 4mg/m3
No teratogenic effects observed at doses tested, Fetotoxicity seen only with maternal toxicity.

Toxicity data for 4,4'-Diphenylmethane Diisocyanate (MDI)
Oral LD50: No Data
Dermal LD50 (rabbit): > 10,000 mg/kg
Inhalation LC50 (rat): > 2240 mg/m3 aerosol, 1 h

Skin Irritation: rabbit, slightly irritating

Eye Irritation: rabbit, slightly irritating

Sensitization:
dermal: sensitizer (guinea pig, Maximisation Test (GPMT))
inhalation: sensitizer (guinea pig)

Repeated Dose Toxicity:
90 days, inhalation: NOAEL: 1 mg/m3, (rat, Male/Female, 6 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, Male/Female, inhalation, 2 years. 17 hrs/day, 5 days/week
negative

Section 12 – Ecological Information

This product has not been tested as a whole. Information for components from available sources is listed below.

Ecological Data for4,4'-Diphenylmethane Diisocyanate (MDI)

Actue and Prolonged Toxicity to Fish
LC50: > 500mg/l (Zebra fish (Brachydanio rerio), 24 hrs)

Acute Toxicity to Aquatic Invertebrates
EC50: > 500 mg/l (Water flea (Daphnia magna), 24 hrs)

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EC50: > 500 mg/l (Water flea (Daphnia magna), 24 hrs)

Section 13 – Disposal Considerations

Waste Disposal Method: Waste disposal should be in accordance with existing federal, state and local environment control laws. Incineration is the preferred method.

Empty Container Precautions: Empty containers retain product residue; observe all precautions for product. Do not heat or cut empty container with electric or gas torch because highly toxic vapors and gases are formed. Do not reuse without thorough commercial cleaning and reconditioning. If container is to be disposed, ensure all product residues are removed prior to disposal.

Section 14 – Transportation Information

Land Transportation DOT: Not Regulated in Non-Bulk Containers

Sea Transportation: Not Regulated in Non-Bulk Containers

Air Transportation: Not Regulated in Non-Bulk Containers

Section 15 – Regulatory Information

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material. To determine applicability or effects of any law or regulation with respect to the product, user should consult his legal advisor or the appropriate government agency.

United States Federal Regulations:

OSHA Hazcom Standard Rating: Hazardous

US Toxic Substances Control Act: Listed on the TSCA Inventory

US EPA CERCLA Hazardous Substances (40 CFR 302):
4,4'-Diphenylmethane Diisocyanate (MDI): Reportable Quantity: 5,000 lbs.

SARA Section 311/312 Hazard Categories:
Acute Health Hazard, Chronic Health Hazard

US EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III
Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A): None

US EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title IIi
Section 313 Toxic Chemicals (40 CRF 372.65) – Supplier Notification Required:
4,4'-Diphenylmethane Diisocyanate (MDI)

US EPA Resource Conservation and Recovery Act (RCRA) composite List of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):
If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40 CFR 261.20-24)

State Right-To-Know Information:

For details of your regulatory requirement you should contact the appropriate agency in your state.

This product contains trace amounts of phenyl isocyanate (CAS# 103-71-9) and monochlorobenzene (CAS# 108-90-7) as impurities.

Massachesetts, New Jersey or Pennsylvania Right to Know Substance Lists:

CAS NO.	Component(s)	%(by wt.)
101-68-8	4,4--Dipheny1methane Diisocyanate (MDI)	10 – 15%
25686-28-6	Diphenylmetane Diisocyanate (MDI) Homopolymer	< 5%
26447-40-5	Diphenylmethane Diisocyanate (2,2,2,4)	< 1%

New Jersey Environmental Hazardous Substances List and/or New Jersey, RTK Special Hazardous Substances Lists:

CAS NO.	Component(s)	%(by wt.)
101-68-8	4,4--Dipheny1methane Diisocyanate (MDI)	10 – 15%

California Prop. 65: This product contains the chemicals listed below, which the state of California has found to cause cancer, birth defects or other reproductive harm.

CAS NO.	Component(s)
	None

Section 16 – Other Information

HMIS RATINGS:	Health	Flammability	Reactivity
	2*	1	1

0=Minimal; 1=Slight; 2=Moderate; 3=Serious; 4=Severe

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To determine applicability or effects of any law or regulation with respect to the product, user should consult his legal advisor or the appropriate government agency. Sign Arts Products does not undertake to furnish advice on such matters.

Company: Sign Arts Products
Date Modified: 10/4/07