Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Product Name: GSP 1595-2A
Product Use: Component of polyurethane.
Effective Date: 1/14/05

Manufactured by:
G.S. Polymers, Inc.
195 Arovista Ave.
Brea, CA 92821
(714) 672-0567 Fax: (714) 672-0987

In an emergency call CHEMTREC @ 800-424-9300

Section 2 – Composition/Information on Ingredients

Ingredients(s)	%(by wt.)	OSHA TLV(ACGIH)	CAS NO.
Dicyclohexylmethane-4,4'-diisocynate (HMDI)	44-54%	Not Established (.054 mg/m3 TWA) (.005 ppm TWA)	5124-30-1

Section 3 – Hazards Identification

EMERGENCY OVERVIEW

Danger! Color: Clear; Form: Liquid; Odor: Odorless; May cause allergic respiratory reaction; Harmful if inhaled; Causes respiratory tract irritation; Skin sensitizer; Causes skin irritation; May cause allergic skin reaction; Cuases eye irritation; Harmful if swallowed; May cause lung damage; Closed container may explode under extreme heat or when contaminated with water; Use cold water spray to cool fire-exposed containers to minimize the risk of rupture; Toxic gases/fumes are given off during burning or thermal decomposition.

Routes of Entry: Skin Contact; Eye Contact; Inhalation

Human Effects and Symptoms of Overexposure:

Acute Inhalation: Inhalation of vapors and mist of dicyclohexylmethane-4,4'-diisocyanate at concentration avove the applicable exposure limit can irritate (burning sensation) the nucous 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 exposure limit with similar symptoms as well as an asthma attack. Exposure well above the exposure limit may lead to bronchitis, bronchial spasm and pulmonary edema (fluid in lungs). These effects are usually reversible. Chemical or hypersensitive pneumonitis, with flu-like symptoms (e.g., fever, chills) has also been reported.

Chronic Inhalation: As a result of previous repeated overexposures or a single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to a later exposure to isocyanates at levels well below the applicable exposure limits. These symptoms, which include chest tightness, wheezing, cough, shortness of breath or asthmatic 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. Chronic overexposure to isocyanates has also been reported to cause lung damage, including decrease in lung function, which may be permanent. Sensitization may be either temporary or permanent.

Acute Skin Contact: Dicyclohexylmethane-4,4'-diisocyanate is a primary skin irritant. It reacts with skin protein and moisture and can cause irritation. Symptoms of skin irritation can include redness, swelling, rash, scaling or blistering. Dicyclohexylmethane-4,4'-diisocyanate is also a potent skin sensitizer. Experiance indicates that direct skin contact is the route of exposure most likely to cause sensitization. Once sensitized, an individual may react even to air borne levels below the applicalbel exposure limit with the folloing symptoms: itching and tingling of the earlobes and neck, rash, hives, swelling of the arms and legs or tother symptoms common to allergic dermatitis. These symptoms may be immediate or delayed for several hours.

Chronic Skin Contact: Prolonged contact with the isocyanate can cause reddening, swelling, rash, scaling or blistering. In those who have developed a skin sensitization, these symptoms can develop as a result of contact with very small amounts of liquid material or even as a result of vapor-only exposure. Animal tests have indicated that respiratory sensitization may result from skin contact with Dicyclohexylmethane-4,4'-diisocyanate. (See Section 11).

Acute Eye Contact: Liquid, vapors and mist of this product are irritation and can cause tearing, reddening and swelling of the eyes, possibly accompanied by a stinging sensation.

Chronic Eye Contact: None known.

Acute Ingestion: Can result in irritation and possible corrosive action in the mouth, stomach tissue and digestive tract.

Chronic Ingestion: None known.

Carcinogenicity: This product and its components are not listed by NTP, IARC or regulated as a carcinogen by OSHA

Medical Conditions Aggravated by Exposure:
Skin allergies, asthma and any other respiratory disorders (bronchitis, emphysema, hyperreactivity), eczema.

Section 4 – First Aid Measures

Eye Contact: Flush with clean, lukewarm water (low pressure) for at least 15 minutes while lifting eyelids. Refer individual to physician or ophthalmologist for immediate followup.

Skin Contact: Remove contaminated clothing immediately. Wash skin promptly and thoroughly with soap and water. After washing, cover affected skin with polyethylene glycol (300-500 molecular weight) and wash again immediately with soap and water to thoroughly remove polyethylene glycol and residual isocyanate. Repeat if necessary. Wash contaminated clothing thoroughly before reuse. For severe exposures, get under safety shower after removing clothing. Seek medical attention if irritation or allergic dermatitis symptoms develop or if gross exposure occurs.

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. Treatment is essentially symptomatic. Consult physician.

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 or convulsing person. Consult physician.

Note to Physicians: Eyes: Stain for evidence of corneal injury. If cornea is burned, instill antibiotic/steroid preparation frequently. Work place vapors could produce reversible corneal epithelial edema impairing vision. Skin: This compund is a potent skin sensitizer. Treat symptomatically as for contact dermatitis or thermal burn. Ingestion: Treat symptomatically. There is no specific antidote. Inducing vomiting is contraindicated becasue of the irritation nature of the compund. symptomatic. Inhalation: Treatment is

essentially symptomatic. An individual having a dermal or pulmonary sensitization reaction to this material should be removed from exposure to any isocyenate.

Section 5 – Fire Fighting Measures

Flash Point:	>392°F (200°C) Pensky-Martens Closed Cup (ASTM D-93)
Extinguishing Media:	Dry chemical; Carbon Dioxide; Foam; Water spray for large fires.
Special Fire Fighting Procedures:	Full emergency equipment with self-contained breathing apparatus and full protective clothing should be worn by firefighters. During a fire, Dicyclohexylmethane-4,4'-diisocyanate vapors and other irritating, highly toxic gases may be generated by thermal decomposition or combustion.
Unusual Fire/Explosion Hazards:	Closed container may explode when exposed to extreme heat or burst when contaminated with water (CO2 evolved).

Section 6 – Accidental Release Measures

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

Spills, Leaks, or Releases: Evacuate nonessential personnel. Remove all sources of ignition and ventilate the are. Dike or impound spilled material and control further spillage if feasible. Notify appropriate authorities if necessary. Cover the spill with absorbent (e.p., vermiculite, sawdust, Fuller's earth) and pour decontamination solution equal amounts of: 1. a mixture of mineral spirits 80%, VM&P Naphtha 15%, and Household Detergent 5% and 2. a misture of 50/50 monoethanol amine-water, totalling two times the estimated spill pool volume, over the spill area and allow to react for 15 minutes. Collect material in open containers. Repeat applications of decontamination solution, with scrubbing, followed by absorbent untilthe surface is decontaminated. Use Swype test kits (Colormetric Laboratories, Inc. Des Plaine, IL 708-696-3036) to check for residual surface contamination. Remove containers to a safe place, cover loosely and allow to stand for 72 hours. (See Personal Protection, Section 8)

Neutralization Chemicals: For tools and equipment: . a mixture of mineral spirits 80%, VM&P Naphtha 15%, and Household Detergent 5%) followed by the same quatity of 50/50 monoethanol amine-water solution.

Section 7 – Handling and Storage

Storage Temperature (Min/Max): 77 F (25 C)/122F (50 C)

Shelf Life: 12 Months @ 77F (25 C)

Special Sensitivity: If container is exposed to temperatures above 122 F (50 C), such as in a fire situation, it can be pressurized and possibly rupture violently. Dicyclohexylmethane-4,4'-diisocyanate reacts slowly with water to form CO2 gas. This gas can cause sealed containers to expand and possibly rupture explosively.

Handling/Storage Precautions: Store in tightly closed containers to prevent moisture contamination. Do not reseal if contamination is suspected. At maximum storage temperatures noted, material may slowly polymerize without hazard. Ideal storage temperaure range is 86-104F (30-40 C). Avoid contact with skin and eyes. Employee education and training in the safe use and handling of this compound are required under the OSHA Hazard Communication Standard.

Other Notes: If Dicyclohexylmethane-4,4'-diisocyanate is stored for prolonged periods at or below a temperature of 77 F (25 C), crystallization and settling of the isomer may occur. Storage in a cold warehouse can cause crystals to form. These crystals can settle to the bottom of the container. If crystals do form, they can be melted easily with modeate heat. It is suggested that a container the size of a drum be warmed for 16-24 hours at 104-122 F (40-50 C). When the crystals are melted, the container should be agitated by rolling or stirring, until the contents are homogeneous. Since heated Dicyclohexylmethane-4,4'-diisocyanate {104-122 F (40-50 C)} will generate vapors more rapidly than product stored at 77 F (25 C), be sure to follow the precautions under Section 8 for personal protection whenever opening a heated Dicyclohexylmethane-4,4'-diisocyanate container.

Section 8 – Exposure Controls/Personal Protection

Required Work/ Hygiene Procedures: The preventation of skin contact with all materials containing monomeric Dicyclohexylmethane-4,4'-diisocynate including adducts, prepolymers and formulations based on Dicyclohexylmethane-4,4'-diisocynate is strongly urged. Since spray application increases the potential for skin contact, stringent precaustions must be taken to ensure the safety of the persons involved with the spray application as well as other persons working in the area who have the potential for skin contact with the uncured material. For additional information on Work/Hygiene Procedures, Skin Protection, Ventilation and Respiratory Protection Requirements.

Eye Protection: Safety glasses, splash goggles or facesheild. Contact lenses should not be worn.

Skin Protection: Any area of skin that could potentially come in contact with Dicyclohexylmethane-4,4'-diisocynate or a system containing residual Dicyclohexylmethane-4,4'-diisocynate, must be covered by a permeation resistant barrier (e.g. rubber glovex, neoprene apron, chemical suit, etc.) When there is potential for a major splash directly onto the skin, a full chemical suit is required. When the application results in airborne vapor or mist, a full permeation resistant suit, including head covering, faceshield, gloves and overshoes, is required.

Ventilation: Hazard control from vapor or spray mist is ideally performed by the use of engineering controls. Effective engineering controls should be used whenever possible to eliminate and/or reduce worker exposure to all respiratory hazards. General ventilation, local ventilation, or isolation may prove adequate to keep airborne concentrations of Dicyclohexylmethane-4,4'-diisocynate below the exposure limit. Exhaust air may need to be cleaned by scrubbers or filters to reduce environmental concentration.

Respiratory Protection: In some situations, a respirator may be necessary in addition to ventilation. The use of a positive pressure air-supplied respirator is madatory when: airborne isocyanate concentrations are not known or exceed 0.005 ppm; operations are performed in a confined space or area with limited ventilation; material is heated or sprayed. An air-purifying respirator is not generally recommended based on the poor warning properties of Dicyclohexylmethane-4,4'-diisocynate (e.g. lack of odor or irritation). By the time the worker would detect, by odor or irritation, leakage of the face seal or breakthrough of the filter cartridge, his exposure could be well above the applicable exposure limit. Consider the type of application, airborne isocyanate concentrations and material being used concurrently when determining respirator use and selection. Observe OSHA regulations for respirator use (29 CFR 1910.134).

Monitoring: Exposure levels must be monitored by accepted monitoring techniques to ensure that they are not exceeded. See Volume 1 (Chapter 17) and Volume 3 (Chapter 3) in Patty's Industrial Hygiene and Toxicology for sampling strategy.

Medical Surveillance: Medical supervision of all employees who handle or come in contact with isocyanates in 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.

Additional Protective Measures: Safety showers and eyewash stations should be available. Educate and train employees in safe use of product. Follow all label instructions.

Section 9 – Chemical and Physical Properties

Physical Form: ..... Liquid
Color: ..... Clear
Odor: ..... Slightly Musty
Boiling Point: ..... Decomposes
Melting Point: ..... Below 77 F (25 C)
Vapor Pressure: ..... .000015 mmHg @ 77F (25C) for HMDI
Solubility (Water): ..... Insoluable; reacts slowly to release CO2 gas
Bulk Density: 8.9
Specific Gravity: 1.07
Viscosity: ..... Approx 30mPa8sec @ 77 F (25C) for HMDI

Section 10 – Stability and Reactivity

Stability:	This is stable material.
Hazardous Polymerization:	May occur; Contact with moisture or other materials which react with isocyanates may cause polymerization
Incompatibilities:	Water, amines, strong bases, alcohols, metal compounds and surface active materials.
Instability Conditions:	Moisture and high heat
Decomposition Products:	By high heat and fire: carbon monoxide, oxides of nitrogen, traces of HCN, Dicyclohexylmethane-4,4'-diisocynate vapors or aerosols.

Section 11 – Toxicology Information

Toxicology Data For: Dicyclohexylmethane-4,4'-diisocynate

Acute Toxicity:

Oral LD50 (rat) 1065 mg/kg
Dermal LD50 (rabbit) 10000 mg/kg
Inhalation LC50 (rat): For 4-hour exposure periods: 434 mg/m3 (Rat); 295 mg.m3 (28 ppm) (Male Rate); 307 mg/m3 (29 ppm) (Female Rat); LCLo: 200 mg/m3 (19 ppm) (Rat); Noel: 113 mg/m3 (11 ppm); Subacute: Exposure for 4 hours/day, 5 days/week, for 2 weeks: 120 mg/m3 (11 ppm) caused respiratory irritation and decreased growth; 40 mg/m3 (4 ppm) caused initial loss of weight (Rat).
Eye effects: Mild, reversible irritation (Rabbit).

Skin Effects: Irritation and potent skin sensitizer (Guinea Pig). Irritation (Rabbit).

Sensitization: Two inhalation studies with guinea pigs indicated possible respiratory sensitization. One study also with guinea pigs indicated that Dicyclohexylmethane-4,4'-diisocynate is not a respiratory sensitizer. An additional study in which Dicyclohexylmethane-4,4'-diisocynate was applied intradermally and followed by an inhalation challenge resulted in a weak respiratory sensitization response in guinea pigs.

Mutagenicity: Ames test negative for mutagenicity with and without liver enzyme activation.

Section 12 – Ecological Information

Ecology Data For: Dicyclohexylmethane-4,4'-diisocynate

Fish Toxicity: Brachydanio – 96 hours; LC0 = 0.69 mg/l; LC50 = 1.20 mg/l; LC100 = 2.76 mg/l

Section 13 – Disposal Considerations

Waste Disposal Method: Waste must be diposed of in accordance with federal, state, and local environmental control regulations. Incineration is the preferred method.

Empty Container Precautions: Empty containers must be handled with care due to product residue. Do not heat or cut empty container with electric or gas torch.

Section 14 – Transportation Information

Not Regulated in Non-Bulk Containers

Section 15 – Regulatory Information

OSHA Status: This product is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200.

TSCA Status: On TSCA Inventory

CERCLA Reportable Quantity: None reported.

SARA Title III

Section 302

Extremely Hazardous Substances: None

Section 311/312

Hazardous Substances: Immediate Health Hazard; Delayed Health Hazard; Reactive Hazard

Section 313

Toxic Chemicals: Dicyclohexylmethane-4,4'-diisocynate, (CAS# 5124-30-1) 85%, De Minimis Concentration for Section 313 is 1.0%

State Regulations:

Dicyclohexylmethane-4,4'-diisocynate is listed on the Massachusetts Hazardous Substance List, New Jersey Hazardous Substance List, New Jersey Environmental Hazardous Substance List, and the Pennsylvania Hazardous Substance List.

California Propostion 65:

To the best of our knowledge, this product contains no levels of listed substances, which the state of California has found to cause cancer, birth defects or other reproductive effects.

Section 16 – Other Information

HMIS Rating: Health: 3* Flammability: 1 Reactivity: 1

The information contained herein is believed to be accurate. It is provided independently of any sale of the product for purpose of hazard communication as part of G.S. Polymers' product safety program. It is not intended to constitute performance information concerning the product. No Express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein.

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. G.S. Polymers does not undertake to furnish advice on such matters.

Prepared by Gerald Salladin_____Date_____
Title: Owner
Company: G.S. Polymers, Inc.
Rev Date: 1/14/05

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Product Name: GSP 1595-2B
Product Use: Component of polyurethane.
Date Effective: 1/14/05

Manufactured by:
G.S. Polymers, Inc.
195 Arovista Ave.
Brea, CA 92821
(714) 672-0567 Fax: (714) 672-0987

In an emergency call CHEMTREC @ 800-424-9300

Section 2 – Composition/Information on Ingredients

Ingredients(s)	%(by wt.)	OSHA TLV(ACGIH)	CAS NO.
Proprietary Polyol Blend	up to 70%	Not Established	Proprietary
Isomers of Di-(methylthio)toluenediamine (DMTDA):			
1,3-Benzenediamine, 4-methyl-2,6-bis(methylthio)-	up to 20%	Not Established	102093-68-5
1,3-Benzenediamine, 2-methyl-4,6-bis(methylthio)-	up to 20%	Not Established	104983-85-9

Section 3 – Hazards Identification

Routes of Entry: Eye Contact, Skin Contact, Ingestion

Human Effects and Symptoms of Overexposure:

Eye Contact: May cause eye irritation or corneal damage in some individuals.

Skin Contact: Expected to be harmful. Prolonged exposure may cause irritation.

Inhalation: Not likely to cause injury, but under certain conditions may irritate the respiratory tract in sensitive individuals.

Ingestion: Expected to be harmful.

Chronic Effects: Rats given DMTDA in diet for up to 90 days showed increased liver metabolic activity. There were kidney effects observed that were unique to male rats. These effects were similar to changes that have been observed in male rats given hydrocarbons. These effects resolved in animals allowed 30 days recovery. Rats treated for 24 months did not have microscopic alterations in any tissues compared to control animals. Tumors seen in control and treated animals were usual for the age and strain of rats.

Section 4 – First Aid Measures

Eye Contact: Flush thorougly with water for 15 minutes. Consult a physician.

Skin Contact: Immediately wash with soap and water for 15 minutes. Remove contaminated clothing. (Wash before reuse.) Destroy contaminate shoes and leather apparrel.

Inhalation: Remove victim to fresh air. Seek medical advice if symptoms persist.

Ingestion: Induce vomiting immmediately by giving two glasses of water and sticking finger down throat. Never give anything by mouth to an unconscious person. Get medical attention.

Note to Physicians: Treatment based on judgement of the physician in response to reactions of the patient.

Section 5 – Fire Fighting Measures

Flash Point: > 275 F (> 135 C)

Extinguishing Media: Dry chemical; Carbon Dioxide; Foam; Water spray for large fires.

Special Fire Fighting Procedures: Keep people away. Isolate fire area deny unnecessary entry. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Avoid breathing smoke and vapor.

Hazardous Decomposition Products: Oxides of Nitrogen and Carbon

Section 6 – Accidental Release Measures

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

Spills, Leaks, or Releases: Dike spill to prevent entry into water system. For minor spills, absord the product with saw dust or other absorbant, shovel into suitable eontainers for disposal. Clean floor uisng detergent and water. For major spills, large quantities may be pumped into sealed containers for disposal.

Section 7 – Handling and Storage

Storage Precautions: Store in well-ventilated, cool, dry area. Keep container closed to protect from contamination. Protect from atmospheric moisture by maintaining a nitrogen atmosphere.

Handling Precautions: Use standard industrial practices. After handling, wash hands before eating or smoking.

Section 8 – Exposure Controls/Personal Protection

Eye Protection: Use chemical goggles.

Skin Protection: Use gloves impervious to this material when prolonged or frequently repeated notact could occur.

Respiratory Protection: For most conditions, no respiratory protection should be needed; however, if handling at elevated temperatures without sufficient ventilation, use an approved air-purifying respirator.

Ventilation: Good general ventilation should be sufficient for most conditions. Local exhause ventilation may be necessary for some operations.

Section 9 – Chemical and Physical Properties

Molecular Formula: ..... Not applicable (mixture)
Physical Form: ..... Liquid
Color: ..... Red
Odor: ..... Slight
Bulk Density: ..... Not Established
Specific Gravity: ..... Not Established
Viscosity: ..... Not Established

Section 10 – Stability and Reactivity

Stability:	This is stable material.
Hazardous Polymerization:	Will not occur.
Incompatibilities:	Avoid contact with oxidizing materials. Avoid contact with acids and isocyanates. The reactions of polyols and isocyanates generates heat. Avoid contact with stong acid.
Decomposition Products:	Depending on temperature, air supply and presence of other materials hazardous decomposition products, may include but are not limited to: aldehydes, ketones, organic acids and polymer fragments.

Section 11 – Toxicology Information

No Data.

Section 12 – Ecological Information

No Data.

Section 13 – Disposal Considerations

Waste Disposal Method: Waste must be diposed of in accordance with federal, state, and local environmental control regulations. Incineration is the preferred method.

Empty Container Precautions: Empty containers must be handled with care due to product residue. Do not heat or cut empty container with electric or gas torch.

Section 14 – Transportation Information

D.O.T.: Not Regulated for Non-Bulk packaging

Section 15 – Regulatory Information

California Propostion 65:
To the best of our knowledge, this product contains no levels of listed substances, which the state of California has found to cause cancer, birth defects or other reproductive effects.

Section 16 – Other Information

HMIS Rating: Health: 2 Flammability: 1 Reactivity: 0

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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. G.S. Polymers does not undertake to furnish advice on such matters.

Prepared by Gerald Salladin_____Date_____
Title: Owner
Company: G.S. Polymers, Inc.
Rev Date: 1/14/05