

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Product Name: GSP 1555A
 Product Use: Component of polyurethane.
 Effective Date: 10/10/04

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

Hazardous Ingredients(s)	%(by wt.)	OSHA TLV(ACGIH)	CAS NO.
Dicyclohexylmethane-4,4'-diisocyanate	up to 85%	Not Established (.054 mg/m ³ TWA) (.005 ppm TWA)	5124-30-1
Prepolymer of Dicyclohexylmethane-4,4'-diisocyanate	15-20%	Not Established	Not Established

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; Causes 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 above the applicable exposure limit can irritate (burning sensation) 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 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. Experience 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 applicable exposure limit with the following symptoms: itching and tingling of the earlobes and neck, rash, hives, swelling of the arms and legs or other 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 compound 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

because of the irritation nature of the compound. 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 isocyanate.

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 (CO ₂ 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 area. 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 mixture 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 until the 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 quantity 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 temperature 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 moderate 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 prevention of skin contact with all materials containing monomeric Dicyclohexylmethane-4,4'-diisocyanate including adducts, prepolymers and formulations based on Dicyclohexylmethane-4,4'-diisocyanate is strongly urged. Since spray application increases the potential for skin contact, stringent precautions 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 faceshield. Contact lenses should not be worn.

Skin Protection: Any area of skin that could potentially come in contact with Dicyclohexylmethane-4,4'-diisocyanate or a system containing residual Dicyclohexylmethane-4,4'-diisocyanate, must be covered by a permeation resistant barrier (e.g. rubber glove, 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'-diisocyanate 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 mandatory 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'-diisocyanate (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 is recommended. These should include preemployment and periodic medical examinations with pulmonary function tests (FEV₁, 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: Odorless
Boiling Point: Decomposes
Melting Point: Below 77 F (25 C)
Solubility (Water): Insoluble; reacts slowly to release CO₂ gas
Bulk Density: 8.87
Specific Gravity: 1.1
Viscosity: Not Established

 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'-diisocyanate vapors or aerosols.

 Section 11 – Toxicology Information

Toxicology Data For: Dicyclohexylmethane-4,4'-diisocyanate
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'-diisocyanate is not a respiratory sensitizer. An additional study in which Dicyclohexylmethane-4,4'-diisocyanate 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'-diisocyanate

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 disposed 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

Technical Shipping Name: Dicyclohexylmethane Diisocyanate

Freight Bulk Class: Isocyanate

Freight Class Package: Chemicals, NOI (Isocyanate) NMFC 60000

Product Label: Product Label Established

DOT (Domestic Surface)

DOT: Other Regulated Substances, Liquid, n.o.s.
 Hazard Class: 9
 UN/NA Number: NA3082
 Packing Group: III
 DOT Product RQ lbs. None
 Hazard Label: Class 9
 Hazard Placard: Class 9

ICAO/IATA (Air)

Proper Shipping Name: Aviation Regulated Liquid, n.o.s.
 Hazards Class Division No.: 9
 UN Number: UN 3334
 Subsidiary Risk: None
 Packing Group: None
 Hazard Label: Miscellaneous
 Radioactivity: Non-Radioactive
 Passenger Air – Max Qty: 100 L
 Passenger Packing Inst: 906
 Cargo Air – Max Qty: 220 L
 Cargo Air Packing Inst: 906

 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'-diisocyanate, (CAS# 5124-30-1) 85%, De Minimis Concentration for Section 313 is 1.0%

State Regulations:

Dicyclohexylmethane-4,4'-diisocyanate 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 Proposition 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: 10/10/04

Material Safety Data Sheet

Section 1 – Chemical Product and Company Identification

Product Name: GSP 1555B
 Product Use: Component of polyurethane.
 Effective Date: 10/10/04

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.
Non-Hazardous Polyol Blend	up to 99%	Not Established	Mixture
Triethylenediamine	< 0.2%	Not Established	280.57-9

Section 3 – Hazards Identification

Routes of Entry: Eye Contact, Skin Contact, Ingestion

Human Effects and Symptoms of Overexposure:

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

Skin Contact: Prolonged exposure may cause slight irritation. A single prolonged exposure is not likely to result in skin absorption in harmful amounts.

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

Ingestion: Oral toxicity is low. Small amounts swallowed incidental to normal handling operations are not likely to cause injury.

Chronic Effects: None known

Carcinogens: This product contains no carcinogens in concentrations of 0.1 percent or greater.

Section 4 – First Aid Measures

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

Skin Contact: Wash with soap and water. Remove contaminated clothing. (Wash before reuse.)

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

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel

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

 Section 5 – Fire Fighting Measures

- Flash Point:** > 360° F Closed Cup (Pensky-Martens)
- Extinguishing Media:** Apply alcohol-type or all-purpose-type foams by manufacturer's recommended techniques for large fires. Use CO2 or dry chemical media for small fires.
- Special Fire Fighting Procedures:** Do not direct a solid stream of water or foam into burning molten material; this may cause spattering and spread the fire.
- Hazardous Decomposition Products:** CO, CO2

 Section 6 – Accidental Release Measures

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

Spills, Leaks, or Releases: Soak up small spills with absorbant material. Larger spills be collected for disposal.

 Section 7 – Handling and Storage

Storage Precautions: Keep container closed to protect form 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 exhaust ventilation may be necessary for some operations.

 Section 9 – Chemical and Physical Properties

Molecular Formula: Not applicable (mixture)

Physical Form: Liquid

Color: Clear

Odor: Odorless

Bulk Density: N/E

Specific Gravity: N/E

Viscosity: N/E

Section 10 – Stability and Reactivity

Stability:	This is stable material.
Hazardous Polymerization:	Will not occur.
Incompatibilities:	Strong oxidizing materials.
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

Not Established.

Section 12 – Ecological Information

Not Established.

Section 13 – Disposal Considerations

Waste Disposal Method: Waste must be disposed 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

Section 15 – Regulatory Information

California Proposition 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: 1 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: 10/10/04