GS POLYMERS
Polyurethane & Epoxy Products

Safety Data Sheet

Section 1 – Chemical Product and Company Identification

1.1 Product identifier:

Product Name: GSP AD204-3
Product Code: AD204-3
Effective Date: 8/25/2015
Revision Date: -

1.2 Recommended use and restrictions on use:

Product Use: Polyurethane adhesive
Restrictions: Not available

1.3 Name, address, and telephone number of the chemical manufacturer:

GS Polymers, Inc.
3687-B Grapevine Street
Mira Loma, CA 91752
(951) 360-0607

1.4 Emergency telephone number:

24 Hr. Emergency CHEMTREC # 1-800-424-9300

Section 2 – Hazards Identification

2.1 Classification according to 29 CFR §1910.1200 (d):

Classification:
Acute toxicity (Inhalation) - Category 4
Skin irritation - Category 2
Eye irritation - Category 2A
Respiratory sensitization - Category 1
Skin sensitization - Category 1
Carcinogenicity - Category 2
Specific target organ toxicity - single exposure - Category 3 (respiratory tract)
Specific target organ toxicity - repeated exposure - Category 1 (respiratory tract)

2.2 Label elements according to 29 CFR §1910.1200 (f):

Hazard Symbols:

Signal Words: Danger

Hazard Statements:
Harmful if inhaled.
Causes skin irritation.
Causes serious eye irritation.

May cause an allergic skin reaction.
May cause allergy or asthma symptoms or breathing difficulties if inhaled.
Suspected of causing cancer.
May cause respiratory irritation.
Causes damage to organs (respiratory tract) through prolonged or repeated exposure if inhaled.

Precautionary Statements:

Prevention: Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe mist/vapors/spray.
Use only outdoors or in a well-ventilated area.
Do not eat, drink or smoke when using this product.
Wash exposed areas thoroughly after handling.
Contaminated work clothing must not be allowed out of the workplace.
Wear protective gloves/protective clothing/eye protection/face protection.
Wear respiratory protection.

Response: IF exposed or concerned: Get medical advice/attention.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN: Wash with plenty of soap and water.
If skin irritation or rash occurs: Get medical advice/attention.
Take off contaminated clothing and wash before reuse.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If eye irritation persists: Get medical advice/attention.

Storage: Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Hazards not otherwise classified in the classification process:
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.

2.4 Ingredients (Present at ≥ 1%) of unknown toxicity:
None

Section 3 – Composition/Information on Ingredients

3.1.1 Hazardous ingredients(s)

Chemical Name	CAS NO.	% (by wt.)
Polyisocyanate prepolymer based on MDI	*	> 70.0 - < 80.0 %
4,4' -Methylenediphenyl diisocyanate	101-68-8	> 10.0 - < 20.0 %
Methylenediphenyl diisocyanate (MDI)	26447-40-5	> 10.0 - < 20.0 %
Methylenediphenyl diisocyanate, homopolymer	39310-05-9	> 1.0 - < 10.0 %

Note: CAS #101-68-8 is an MDI isomer that is part of CAS 26447-40-5.

3.1.2 Non-hazardous ingredient(s)
Remaining components are non-hazardous and/or present at amounts below reportable limits.

3.2 Trade secrets (if applicable):
* Designates a specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

Section 4 – First Aid Measures

4.1 Description of first aid measures

Eyes: Immediately flush eyes with water; remove contact lenses, if present, after the first 5 minutes, then continue flushing eyes for at least 15 minutes. Obtain medical attention without delay, preferably from an ophthalmologist. Suitable emergency eye wash facility should be immediately available.

Skin: Remove material from skin immediately by washing with soap and plenty of water. Remove contaminated clothing and shoes while washing. Seek medical attention if irritation persists. Wash clothing before reuse. An MDI skin decontamination study demonstrated that cleaning very soon after exposure is important, and that a polyglycol-based skin cleanser or corn oil may be more effective than soap and water. Discard items which cannot be decontaminated, including leather articles such as shoes, belts and watchbands. Suitable emergency safety shower facility should be available in work area.

Inhalation: Move victim to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Get medical attention if victim feels unwell. If victim is unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as collar, tie belt or waistband.

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

4.2 Most important symptoms and effects, both acute and delayed:
Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

4.3 Indication of any immediate medical attention and special treatment needed:
Notes to physician: Maintain adequate ventilation and oxygenation of the patient. May cause respiratory sensitization or asthma-like symptoms. Bronchodilators, expectorants and antitussives may be of help. Treat bronchospasm with inhaled beta2 agonist and oral or parenteral corticosteroids. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. If you are sensitized to diisocyanates, consult your physician regarding working with other respiratory irritants or sensitizers. Cholinesterase inhibition has been noted in human exposure but is not of benefit in determining exposure and is not correlated with signs of exposure. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient. Excessive exposure may aggravate preexisting asthma and other respiratory disorders (e.g. emphysema, bronchitis, reactive airways dysfunction syndrome).

Section 5 – Fire-Fighting Measures

5.1 Suitable extinguishing media:
Use dry chemical, CO_2, fine water spray (fog) or foam. Alcohol resistant foams (ATC type) are preferred.

5.2 Specific hazards arising from the product:

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Nitrogen oxides. Isocyanates. Hydrogen cyanide. Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction. Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids. Dense smoke is produced when product burns.

5.3 Special protective equipment and precautions for fire-fighters:

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Water is not recommended, but may be applied in large quantities as a fine spray when other extinguishing agents are not available. Do not use direct water stream. May spread fire. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Move container from fire area if this is possible without hazard. Use water spray to cool fire-exposed containers and fire-affected zone until fire is out. Contain fire water run-off if possible. Fire water runoff, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire-fighting clothing (includes fire-fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire-fighting operations. If contact is likely, change to full chemical resistant fire-fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

Section 6 – Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:
Isolate area. Keep unnecessary and unprotected personnel from entering the area. Keep personnel out of low areas. Keep upwind of spill. Spilled material may cause a slipping hazard. Ventilate area of leak or spill. If available, use foam to smother or suppress. Refer to section 7, Handling, for additional precautionary measures. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

6.2 Methods and materials for containment and cleaning up:
Contain spilled material if possible. Absorb with materials such as: Vermiculite. Dirt. Sand. Clay. Do NOT use absorbent materials such as: Cement powder (Note: may generate heat). Collect in suitable and properly labeled open containers. Do not place in sealed containers. Suitable containers include: Metal drums. Plastic drums. Polylined fiber pacs. Wash the spill site with large quantities of water. Attempt to neutralize by adding suitable decontaminant solution: Formulation 1: sodium carbonate 5 - 10%; liquid detergent 0.2 - 2%; water to make up to 100%, OR Formulation 2: concentrated ammonia solution 3 - 8%; liquid detergent 0.2 - 2%; water to make up to 100%. If ammonia is used, use good ventilation to prevent vapor exposure. Contact your supplier for clean-up assistance. See Section 13, Disposal Considerations, for additional information.

Section 7 – Handling and Storage

7.1 Precautions for safe handling:

Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Use with adequate ventilation. Wash thoroughly after handling. Keep container tightly closed. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.

7.2 Conditions for safe storage, including any incompatibilities:

Protect from temperatures below: 77 °F (25 °C)
Protect from temperatures above: 95 °F (35 °C)

Store in a dry place. Protect from atmospheric moisture. Do not store product contaminated with water to prevent potential hazardous reaction. See Section 10 for more specific information. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact.

Section 8 – Exposure Controls/Personal Protection

8.1 Exposure Limits:

Chemical Name	CAS NO.	OSHA (ACGIH) TLV
Polyisocyanate prepolymer based on MDI	*	Not Established
4,4' -Methylenediphenyl diisocyanate	101-68-8	0.005 ppm TWA
Methylenediphenyl diisocyanate (MDI)	26447-40-5	Not Established
Methylenediphenyl diisocyanate, homopolymer	39310-05-9	Not Established
4-methyl,1-3 Dioxolane-2-one	108-32-7	Not Established

8.2 Engineering Controls:

Use only with adequate ventilation. Local exhaust ventilation may be necessary for some operations. Provide general and/or local exhaust ventilation to control airborne levels below the exposure guidelines. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. The odor and irritancy of this material are inadequate to warn of excessive exposure.

8.3 Personal Protective Equipment:

Eye Protection: Use chemical goggles.

Skin Protection: **Hand protection:** Use gloves chemically resistant to this material. Examples of preferred glove barrier materials include: Butyl rubber. Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton.

Other protection: Use protective clothing chemically resistant to this material. Selection of specific items such as face shield, boots, apron, or full body suit will depend on the task.

Respirators: Atmospheric levels should be maintained below the exposure guideline. When atmospheric levels may exceed the exposure guideline, use an approved air purifying respirator equipped with an organic vapor sorbent and a particle filter. For situations where the atmospheric levels exceed the level for which an air-purifying respirator is effective, use a positive-pressure air-supplying respirator (air line or self-contained

breathing apparatus). For emergency response or for situations where the atmospheric level is unknown, use an approved positive-pressure self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Hygienic Practices: Wash hands before eating, smoking or using toilet facilities. Do not smoke in any chemical handling and storage areas. Food or beverages should not be consumed near where this product is stored. Remove and wash contaminated clothing before reuse. Ensure that eyewash stations and safety showers are close to the workstation location.

Section 9 – Physical and Chemical Properties

Appearance	Liquid
Color	Yellow
Odor	Fruity
Odor Threshold	0.4 ppm (Odor is inadequate warning of excessive exposure)
pH	Not Established
Melting Point/Freezing Point	Not Established
Boiling Point	Not Established
Flash Point	>351°F (>177°C)
Evaporation Rate	Not Established
Upper/Lower flammability or explosive limits	Not Established
Vapor Pressure	0.0059 Pa at 68°F
Vapor Density	Not Established
Relative Density	
Specific Gravity	1.10
Bulk Density (lbs./gal)	9.18
Solubility	Insoluble, Reacts with Water
Partition Coefficient; n-octanol/water	Not Established
Auto-ignition temperature	Not Established
Viscosity	Not Established

Note: Physical data presented above are typical values and should not be construed as a specification.

Section 10 – Stability and Reactivity

10.1 Reactivity:

Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact; these reactions can become violent. Contact is increased by stirring or if the other material mixes with the diisocyanate. Contact is increased by stirring or if the other material acts as a solvent. Products based on diisocyanates such as TDI and MDI are not soluble in water and will sink to the bottom, but react slowly at the interface. Reaction with water will generate carbon dioxide and heat.

10.2 Chemical Stability:

Stable under recommended storage conditions. See Storage, Section 7.

10.3 Possibility of Hazardous Reactions:

Can occur. Exposure to elevated temperatures can cause product to decompose and generate gas. This can cause pressure build-up and/or rupturing of closed containers. Polymerization can be catalyzed by: Strong bases. Water.

10.4 Conditions to Avoid:
Exposure to elevated temperatures can cause product to decompose. Generation of gas during decomposition can cause pressure in closed systems. Pressure build-up can be rapid. Avoid moisture. Material reacts slowly with water, releasing carbon dioxide which can cause pressure buildup and rupture of closed containers. Elevated temperatures accelerate this reaction.

10.5 Incompatible Materials:
Avoid contact with: Acids. Alcohols. Amines. Water. Ammonia. Bases. Metal compounds. Moist air. Strong oxidizers. Diisocyanates react with many materials and the rate of reaction increases with temperature as well as increased contact; these reactions can become violent. Contact is increased by stirring or if the other material mixes with the diisocyanate. Diisocyanates are not soluble in water and sink to the bottom, but react slowly at the interface. The reaction forms carbon dioxide gas and a layer of solid polyurea. Reaction with water will generate carbon dioxide and heat. Avoid contact with metals such as: Aluminum. Zinc. Brass. Tin. Copper. Galvanized metals. Avoid contact with absorbent materials such as: Moist organic absorbents. Avoid unintended contact with polyols. The reaction of polyols and isocyanates generate heat.

10.6 Hazardous Decomposition Products:
Decomposition products depend upon temperature, air supply and the presence of other materials. Gases are released during decomposition.

Section 11 – Toxicological Information

11.1 Information on the likely routes of exposure:
Inhalation, skin contact.

11.2 Symptoms related to the physical, chemical and toxicological characteristics:

Skin corrosion/irritation
Prolonged contact may cause moderate skin irritation with local redness.
Material may stick to skin causing irritation upon removal.
May stain skin.

Serious eye damage/eye irritation
May cause moderate eye irritation.
May cause slight temporary corneal injury.

Sensitization
Skin contact may cause an allergic skin reaction.
Animal studies have shown that skin contact with isocyanates may play a role in respiratory sensitization.
May cause allergic respiratory reaction.
MDI concentrations below the exposure guidelines may cause allergic respiratory reactions in individuals already sensitized.
Asthma-like symptoms may include coughing, difficult breathing and a feeling of tightness in the chest.
Occasionally, breathing difficulties may be life threatening.

Specific Target Organ Systemic Toxicity (Single Exposure)
May cause respiratory irritation.
Route of Exposure: Inhalation
Target Organs: Respiratory system

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Tissue injury in the upper respiratory tract and lungs has been observed in laboratory animals after repeated excessive exposures to MDI/polymeric MDI aerosols.
Contains a component which is reported to be a weak organophosphate-type cholinesterase inhibitor.
Excessive exposure may produce organophosphate type cholinesterase inhibition.

Signs and symptoms of excessive exposure may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions.

Carcinogenicity
Lung tumors have been observed in laboratory animals exposed to respirable aerosol droplets of MDI/Polymeric MDI (6 mg/m^3) for their lifetime. Tumors occurred concurrently with respiratory irritation and lung injury. Current exposure guidelines are expected to protect against these effects reported for MDI.

Teratogenicity
In laboratory animals, MDI/polymeric MDI did not cause birth defects; other fetal effects occurred only at high doses which were toxic to the mother.

Mutagenicity
Genetic toxicity data on MDI are inconclusive. MDI was weakly positive in some in vitro studies; other in vitro studies were negative. Animal mutagenicity studies were predominantly negative. Animal genetic toxicity studies were negative in some cases and positive in other cases.

Aspiration Hazard
Based on physical properties, not likely to be an aspiration hazard.

11.3 Delayed and immediate effects and also chronic effects from short and long term exposure:
No data available

11.4 Numerical Measure of toxicity (Acute toxicity estimates)

Acute Toxicity Data:
Based on information for similar material:

LD50 Oral	Rat	> 5000 mg/kg	
LD50 Dermal	Rabbit	>9400 mg/kg	
LC50 Inhalation	Rat	2.24 mg/l	Aerosol 1 hour (For similar material 4,4'-MDI CAS 101-68-8)

11.5 Carcinogenicity:
Not Available

Section 12 – Ecological Information

12.1 Ecotoxicity:
Based on information for similar material:

Acute toxicity to fish:
Material is practically non-toxic to aquatic organisms on an acute basis.
(LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
LC50, Danio rerio (zebra fish), static test, 96 Hour, > 1,000 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
EC50, Daphnia magna (Water flea), static test, 24 Hour, > 1,000 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (green algae), static test, 72 Hour, Growth rate inhibition, 1,640 mg/l, OECD Test Guideline 201 or Equivalent

Toxicity to bacteria
EC50, activated sludge, static test, 3 Hour, Respiration rates. > 100 mg/l

Toxicity to soil-dwelling organisms
EC50, Eisenia fetida (earthworms), Based on information for a similar material: 14 d, > 1,000 mg/kg

Toxicity to terrestrial plants
EC50, Avena sativa (oats), Growth inhibition, 1,000 mg/l
EC50, Lactuca sativa (lettuce), Growth inhibition, 1,000 mg/l

12.2 Persistence and Degradability:
In the aquatic and terrestrial environment, material reacts with water forming predominantly insoluble polyureas which appear to be stable. In the atmospheric environment, material is expected to have a short tropospheric half-life, based on calculations and by analogy with related diisocyanates.

12.3 Bioaccumulative Potential:
Bioconcentration potential is low based on information for similar material.

12.4 Mobility in Soil:
In the aquatic and terrestrial environment, movement is expected to be limited by its reaction with water forming predominantly insoluble polyureas.

12.5 Other Adverse Effects:
Not Available

Section 13 – Disposal Considerations

13.1 Information on waste and methods of disposal
Dispose of contents in accordance with all local, regional, national and international regulations.

Section 14 – Transportation Information

14.1 Transportation information

Land Transportation (DOT):
When in individual containers of less than the Reportable Quantity (5000 lbs. MDI), this material ships as non-regulated.

Sea Transportation (IMDG):
Not regulated for transportation

Air Transportation (IATA):
Not regulated for transportation

14.2 Transportation in bulk according to Annex II of Marpol 73/78 and the IBC Code:
This product is not intended to be transported in bulk containers.

14.3 Special precautions for transportation:
No data available

Section 15 – Regulatory Information

15.1 Safety, health and environmental regulations specific for the product in question.
This 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 seek legal advice or consult with the appropriate government agency. GS Polymers, Inc. does not undertake to furnish advice on regulatory matters.

United States Federal Regulations:
US EPA CERCLA Hazardous Substances (40 CFR 302):
Not Evaluated

SARA Section 311/312 Hazard Categories:
Reactivity Hazard
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):
Not Evaluated

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' -Methylenediphenyl diisocyanate 101-68-8

State Right-To-Know Information:
For details of your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania Right to Know Substance Lists:
4,4' -Methylenediphenyl diisocyanate 101-68-8 (MA, NJ, PA)
Methylenediphenyl diisocyanate (MDI) 26447-40-5 (MA)

California Prop. 65: This product contain a chemical(s) known to the State of California to cause birth defects or other reproductive harm.

Section 16 – Other Information

16.1 Date of preparation or last revision:

Company:	GS Polymers, Inc.
Rev Date:	8/25/2015
Rev By:	BN

Reason for Change:
This revision updates SDS formatting according to OSHA Hazard Communications Standard (HCS) promulgated on March 20, 2012.

16.2 Additional information:

HMIS Ratings:

Health:	2*
Flammability:	1
Physical Hazard:	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 GS 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 seek legal advice or consult with the appropriate government agency. GS Polymers, Inc. does not undertake to furnish advice on such matters.