Safety Data Sheet

In accordance with OSHA Hazard Communication Standard 29 CFR 1910.1200

Purios A
A – Side

SECTION 1: Product identification and company identification
Product identification
Purios A, A – Side
Relevant identified uses of the substance or mixture and uses advised against
Components producing polyurethane foam**.**
Company identification
Purinova LLC
111 W Jackson Blvd #1700,
Chicago, Il 60604, Illinois, USA
tel. +1 312-981-8427
E-mail: sds@purinova.com
Emergency Telephone
911 – emergency number

SECTION 2: Hazard identification:
This material is classified hazardous under OHSA Hazard Communication Standard (29 CFR 1910.1200).

Acute Tox. 4	Harmful in inhaled
Skin Irrit. 2	Causes skin irritation
Eye Irrit. 2	Causes serious eye irritation
Resp. Sens. 1	May cause allergy or asthma symptoms or breathing difficulties if inhaled
Skin Sens. 1	May cause an allergic skin reaction
STOT SE. 3	May cause respiratory irritation
STOT RE. 3	May cause damage to organs through prolonged or rapeated exposure

Hazard Pictograms

Signal Word: DANGER

Hazard Statement
H332 Harmful in inhaled
H315 Causes sin irritation
H319 Causes serious eye irritation
H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled
H317 May cause an allergic skin reaction
H335 May cause respiratory irritation
H373 May cause damage to organs through prolonged or rapeated exposure
Precautionary Statement
Prevention

P260 Do not breathe fume/mist/vapors/spray.
P264 Wash exposed skin thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 In case of inadequate ventilation, wear respiratory protection.
Response
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a Poison Center/doctor if you feel unwell.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313 If eye irritation persists: Get medical attention.
P302+P352 IF ON SKIN: wash with plenty of soap and water.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P362+P364 Take off contaminated clothing and wash it before reuse.
P308 + P313 IF exposed or concerned: Get medical advice/ attention.
Storage
P403+233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
Disposal
P501 Dispose of contents/containers in accordance with local/ regional/ national/ international regulations.

Hazards not otherwise classified (HNOC)

Toxic fumes may be released in fire situations. Can decompose at high temperatures forming toxic gases.
Closed containers may develop pressure and rupture on prolonged exposure to heat or if contaminated with water.
USA: This material is considered a hazardous chemical by the OSHA Hazard Communication Standard (29 CFR 1910.1200) (2012).
Canada: This is a controlled product under WHMIS.

SECTION 3: Composition and information on ingredients

Chemical name

Dangerous component	CAS no.	Content [% mass]
diphenylmethane 4, 4’ diisocyanate monomeric and polymers	9016-87-9	30 – 70
4,4'-methylenediphenyl diisocyanate	101-68-8	30 – 70

SECTION 4: First aid measures

Description of first aid measures

Precautions: First aid providers should avoid direct contact with this chemical. Wear chemical protective gloves, if necessary. Take proper precautions to ensure your own safety before attempting rescue, (e.g. wear appropriate protective equipment).
Inhalation: If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If exposed or concerned: Get medical advice/attention.
If breathing has stopped, trained personnel should begin artificial respiration (AR) or, if the heart has stopped, cardiopulmonary resuscitation (CPR) immediately. Immediately obtain medical attention and transport victim to an emergency care facility.
Eye Contact: Gently blot or brush away excess chemical quickly.
If product is a solid in the eye: Do not allow victim to rub eye(s). Let the eye(s) water naturally for a few minutes. Have victim look right and left, and then up and down. If particle/dust does not dislodge, flush with lukewarm, gently flowing water for 5 minutes or until particle/dust is removed, while holding the eyelid(s) open. If irritation persists, obtain medical attention. DO NOT attempt to manually remove anything stuck to eye(s).
If product is a liquid: Immediately flush the contaminated eye(s) with lukewarm, gently flowing water for at least 5

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minutes, or until the chemical is removed, while holding the eyelid(s) open. If irritation persists, repeat flushing. Obtain medical attention immediately.
Skin Contact: As quickly as possible, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Quickly and gently blot or brush away excess chemical. Immediately wash with lukewarm, gently flowing water and non-abrasive soap for 15-20 minutes. Completely decontaminate clothing, shoes and leather goods before reuse or discard.
If skin irritation or rash occurs: Get medical advice/attention.
Ingestion: If swallowed, call a POISON CENTER or doctor/physician.
Never give anything by mouth if victim is rapidly losing consciousness or is unconscious or convulsing. Do not induce vomiting. If vomiting occurs naturally, have victim lean forward to reduce risk of aspiration. Quickly transport victim to an emergency care facility.
Most important symptoms and effects, both acute and delayed
Inhalation: Respiratory tract irritation and mucous membrane irritation. Symptoms include eye and nose irritation, dry or sore throat, runny nose, shortness of breath, wheezing and laryngitis. Coughing with chest pain or tightness may also occur, frequently at night. These symptoms may occur during exposure or may be delayed several hours. Exposure to isocyanates can cause difficulty breathing or asthmatic reaction.
Eye Contact: Irritation of the eye tissue.
Skin Contact: Tingling, irritation or redness of the skin.
Ingestion: Irritation of the tissues of the mouth, throat and digestive tract. Other symptoms include headache, shortness of breath, nausea, vomiting, weakness, burning sensation in the mouth, abdominal pain and vomiting. Onset of symptoms may be delayed.
Indication of any immediate medical attention and special treatment needed:
Get immediate medical advice/attention allergy symptoms develop.

SECTION 5: Firefighting measures.
Flammable Properties:
This material can burn if heated. Flashpoint = 230°C
Suitable extinguishing Media:
Carbon dioxide, dry chemical powder, foam, water fog or fine spray. Alcohol resistant foams are preferred for large fires. Use water spray to cool fire-exposed containers.
Unsuitable extinguishing Media:
Exercise caution when using water; water contamination of product will generate CO2 gas.
Explosion Data:
Sensitivity to Mechanical Impact:
Not applicable
Sensitivity to Static Discharge:
Not available
Specific Hazards arising from the Chemical:
During a fire products of combustion may include carbon monoxide, carbon dioxide, hydrogen cyanide, nitrogen oxides, dense smoke and irritating or toxic fumes. Reacts vigorously with water above 50°C. Closed containers may rupture violently when heated. Polymeric MDI decomposes rapidly above 204°C.
Protective Equipment and precautions for firefighters:
Firefighters should wear full protective gear including self-contained breathing apparatus when fighting chemical fires. Fight fire from a protected location or a safe distance. When using water care must be taken since the reaction between water and hot Polymeric MDI can be vigorous.
SECTION 6: Accidental release measures
Personal precautions, protective equipment and emergency procedures
Wear adequate personal protective equipment as indicated in Section 8. Isolate spill area, preventing entry by unauthorized persons. Ventilate area of spill. Extinguish or remove all ignition sources. Spilled product presents a slipping hazard. Do not touch spilled material.
Environmental precautions
Prevent the material from entering sewers, drainage systems, groundwater and surface water.

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Methods and materials for containment and cleaning up
Immediately shut off the leak if it is safe to do so. Contain the spill with earth, sand, sawdust or suitable absorbent. If control of isocyanate vapor is required, cover the spilled material with protein foam.
Shovel into open-top drums or plastic bags for further decontamination, if necessary. Do not seal drums or containers.
Neutralize small spills with decontaminant solution (see below).
Reference to other sections
Wash area with Decontamination solution of 0.2-0.5% liquid detergent and 3-8% concentrated ammonium hydroxide in water (5-10% sodium carbonate may be substituted for the ammonium hydroxide). Allow material to stand for 48 hours to let carbon dioxide gas escape.

SECTION 7: Handling and storage
Precautions for safe handling
Do not breathe fumes, vapors or spray mist from this material. Avoid contact with skin and eyes. Provide adequate ventilation in the workplace. If Polymeric MDI is released, leave the area until the severity of the release is determined. Immediately report leaks, spills or ventilation failures.
Do not use with incompatible materials such as amines, alcohols, acids, bases, metal compounds, surfactants and water which may react vigorously and/or violently.
Do not use near welding operations, flames or hot surfaces because of the risk of formation of toxic hydrogen cyanide and nitrogen oxides. Avoid generating mist. Prevent the release of aerosol into workplace air. Do not reseal containers if contamination of Polymeric MDI is suspected. Keep containers closed when not in use. Assume that empty containers contain residues which are hazardous.
Conditions for safe storage, including any incompatibilities:
Store in a dry, well-ventilated area, out of direct sunlight and away from heat, sources of ignition and incompatible materials. Ideal storage temperature is 16 – 38°C (60 – 100°F). Keep contents away from moisture; Polymeric MDI reacts with water producing CO2 gas, a hazardous build-up of pressure could result if contaminated containers are re-sealed. Do not re-seal contaminated containers. Store product in its original container.
Specific end uses
Use this product only in accordance with the application.

SECTION 8: Exposure controls/personal protection
Ingredient Name - Diphenylmethane diisocyanate
Control parameters – United States

Ingredient	ACGIH TLV (8-hr. TWA) (mg/m3)	U.S. OSHA PEL (8-hr. TWA) (mg/m3)	Alberta (Canada) TWA	UK OEL (8-hr. TWA) (mg/m3)
Polymeric MDI	Not established	Not established	0.005 ppm 0.07 mg/m3	Not established
Methylene diphenyl diisocyanate (MDI)	0.051 (0.005 ppm)	0.2 (0.02 ppm)	0.005 ppm Designated Substance	0.02 0.07 STEL

Engineering Controls:
Local exhaust ventilation may be necessary when operations generate airborne concentrations of this material (e.g. molding and curing of polyurethane products, especially if heating or spraying is involved). If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection. Have appropriate equipment available for use in emergencies such as spills or fire.
Personal Protection:
Eye/Face Protection:
Wear safety goggles. Wear a face-shield when necessary to prevent contact with skin and eyes.
Skin Protection:
Wear chemical protective gloves, coveralls, boots and/or other resistant protective clothing to prevent skin exposure. Protective gloves are those made from butyl rubber, nitrile rubber and polyvinyl alcohol. Evaluate resistance under

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conditions of use and maintain protective clothing carefully.

Respiratory Protection:

A respiratory protection program that meets the regulatory requirement, such as OSHA's 29 CFR 1910.134 and ANSI Z88.2 or Canadian Standards Association (CSA) Standard Z94.4-2002, must be followed whenever workplace conditions warrant a respirator's use.

NIOSH Recommendations for MDI concentrations in air:

Up to 0.5 mg/m3: (APF = 10) Any supplied-air respirator

Up to 1.25 mg/m3: (APF = 25) Any supplied-air respirator operated in a continuous-flow mode

Up to 2.5 mg/m3: (APF = 50) Any self-contained breathing apparatus with a full facepiece (APF = 50) Any supplied-air respirator with a full facepiece

Up to 75 mg/m3: (APF = 2000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode

Emergency or planned entry into unknown concentrations or IDLH conditions: (APF = 10,000) Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode (APF = 10,000) Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained positive-pressure breathing apparatus

Escape: (APF = 50) Any air-purifying, full-facepiece respirator (gas mask) with a chin-style, front- or back-mounted organic vapor canister having an N100, R100, or P100 filter.

Other Protective Equipment:

Have a safety shower and eye-wash fountain readily available in the immediate work area.

Work/Hygienic Practices:

Workers whose clothing has been contaminated by product should change into clean clothing promptly. Discard all contaminated leather clothing articles (e.g. belts, watchbands, shoes). Do not eat, smoke or drink in workplaces where this product is processed by machining operations. Wash hands carefully before eating, drinking, smoking or using the toilet.

SECTION 9: Physical and chemical properties

Information on basic physical and chemical properties

Physical appearance	Liquid, color brown
Odour	Earthy, musty
Odour threshold	No data available
pH value	No data available
Melting / freezing point	No data available
Boiling point / boiling range	> 204°C (decomposes) [399 °F]
Flash point	230 °C [446 °F]
Evaporation rate	No data available
Flammability (solid state, gas)	Supporting combustion
Upper / lower flammability / explosion	No data available
Oxidizing properties	Not applicable
Vapour pressure	10-4 mmHg @ 40°C
Vapour density	No data available
Relative density	1,25 [g/cm^3] w 25 °C [77 °F]
Viscosity	200 +/- 50 mPas
Decomposition Temperature	>300°C [572°F]
Solubility	insoluble in water

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SECTION 10: Stability and reactivity

Chemical Stability:

Stable under normal conditions.

Isocyanates are very reactive compounds and are especially highly reactive toward a large number of compounds with active hydrogens, particularly at high temperatures and in the presence of catalysts. May attack and make brittle many plastic and rubber materials.

Conditions to Avoid:

Avoid conditions of heat, moisture and direct sunlight.

Incompatible Materials:

Water - Reacts slowly, forming carbon dioxide and inert material comprised of polyureas which could rupture closed containers. 4,4'-methylene dianiline is formed as an intermediate product in this reaction. Above 50°C (122°F), the reaction becomes progressively more vigorous. Amines, Alcohols, Acids, Bases - May react violently with generation of heat. Metal compounds (e.g. organotin catalysts) - May polymerize with the generation of heat and pressure. Amides, phenols, mercaptans, urethanes, ureas and surface active compounds (surfactants, non-ionic detergents) - May react vigorously or violently with the generation of heat.

Hazardous Decomposition Products:

By thermal decomposition and combustion, product may generate carbon monoxide, carbon dioxide, oxides of nitrogen, hydrogen cyanide, dense smoke and irritating or toxic fumes.

4,4'-Methylene dianiline can be formed by reaction of MDI with water.

Possibility of Hazardous Reactions:

Polymeric MDI may undergo uncontrolled exothermic polymerization upon contact with incompatible materials or if heated above 175-204°C. The resulting pressure build-up could rupture closed containers.

May cause some corrosion to copper alloys and aluminum.

SECTION 11: Toxicological information

Acute Health Effects:

Inhalation: Airborne exposures are unlikely to occur unless product is heated or forms an aerosol or mist during pouring, frothing or spraying operations. Polymeric MDI has an extremely low vapour pressure and it is difficult to achieve vapour concentrations necessary for inhalation toxicity testing. The desired vapour concentrations can only be obtained by heating the Polymeric MDI source. The vapour evolved readily condenses to an aerosol in the inhalation exposure chambers. Therefore, it is likely that an aerosol rather than a vapour was present. Symptoms of severe irritation and deaths occurred at 13.6 mg/m3. Less severe irritation and no deaths occurred at 4.9 mg/m3. There were no visible effects at 2.2 mg/m3.

Some people may become sensitized to MDI, causing allergy or asthma symptoms or breathing difficulties if inhaled.

High aerosol concentrations could cause inflammation of the lung tissue (chemical pneumonitis), chemical bronchitis with severe asthma-like wheezing, severe coughing spasms and accumulation of fluid in the lungs (pulmonary edema), which could prove fatal. Symptoms of pulmonary edema may not appear until several hours after exposure and are aggravated by physical exertion.

Ingestion: Ingestion is not expected with normal, occupational use of this product. Animal studies indicate that ingested Polymeric MDI has low toxicity. Swallowing may result in irritation and corrosion of the mouth, throat and digestive tract.

Skin: Polymeric MDI can cause mild irritation. Isocyanates, in general, can cause skin discolouration (staining) and hardening of the skin after repeated exposures. Skin sensitization, resulting in dermatitis, may occur in some individuals. Cured material may be difficult to remove from the skin.

Application of single doses of 2.5, 3.9, 6.0 and 9.4 mg/kg Polymeric MDI to abraded skin of rabbits, under a cover for 24 hours, caused only minor, local, reversible skin changes.

Eye: Contact with liquid, mist and aerosols may cause irritation with redness, swelling, pain and watering of the eyes. Commercial Polymeric MDI caused eye irritation in rabbits, which cleared after 24 hours.

Acute Toxicity Data

Product	**LD_{50} Oral (mg/kg)**	**LD_{50} Dermal (mg/kg)**	**LC_{50} Inhalation (mg/m_3 / 4 hrs.)**
Polymeric MDI	>10 000 (rat)	>6 200 (rabbit)	490 (rat) Aerosol
Methylene diphenyl diisocyanate (MDI)	2 200 (mouse)	>10 000 (rabbit)	370 (rat) Aerosol

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Chronic Health Effects:

Inhalation: Polymeric MDI is a severe respiratory irritant. Long-term, low-level exposure could cause severe, permanent respiratory impairment. Respiratory sensitization can develop in people working with Polymeric MDI or its main component Methylene diphenyl diisocyanate (MDI). Sensitized individuals react to very low levels of MDI (as low as 0.0014 ppm) that have no effect on unsensitized people. Symptoms may initially appear to be a cold or mild hay fever; severe asthmatic symptoms can develop and include wheezing, chest tightness, shortness of breath, difficulty breathing and/or coughing. Fever, chills, general feelings of discomfort, headache and fatigue can also occur. Symptoms may occur immediately upon exposure or may be delayed. Sensitized people who continue to work with MDI may develop symptoms sooner after each exposure. The number and severity of symptoms may increase. MDI and other isocyanates may also cause hypersensitivity pneumonitis, another allergic lung disease, which is characterized by symptoms such as shortness of breath, fever, tiredness, non-productive cough, and chills.

Sensitization:

May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause an allergic skin reaction. Isocyanates are known to cause skin and respiratory sensitization in humans. Animal tests have indicated that respiratory sensitization can result from skin contact with diisocyanantes.

Neurological Effects:

Not available

Genetic Effects:

Not available

Reproductive Effects:

Not available

Developmental Effects:

Not available

Target Organ Effects:

Long-term, low-level exposure may cause severe, permanent respiratory impairment.

Carcinogenicity:

This material does not contain any component that is considered a human carcinogen by IARC (International Agency for Research on Cancer), ACGIH (American Conference of Governmental Industrial Hygienists, OSHA or NTP (National Toxicology Program).

The International Agency for Research on Cancer (IARC) has concluded that Polymeric MDI and MDI are not classifiable as to their carcinogenicity to humans (Group 3).

Although lifetime inhalation of PMDI aerosols by rats resulted in a small number of benign adenomas, they are considered to be of unlikely relevance to occupational exposures. Such aerosols are not encountered outside of the experimental laboratory.

Medical Conditions Aggravated by Exposure:

Skin exposure may aggravate existing dermatitis conditions.

Interactions With Other Chemicals:

Not available

SECTION 12: Ecological information

Ecotoxicity:

Polymeric MDI - LC50, Zebra fish >1 000 mg/L.

EC50 Daphnia magna (24 hour) >1 000 mg/L.

EC50 E. coli >100 mg/L.

Persistence/Degradability:

Product is not readily biodegradeable.

Bioaccumulation/Accumulation:

Not available

Mobility:

Not available

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SECTION 13: Disposal consideration

Waste Disposal Method:

Do NOT dump into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage.

USA:

Dispose of in accordance with local, state and federal laws and regulations.

Canada:

Dispose of in accordance with local, provincial and federal laws and regulations.

EC:

Waste must be disposed of in accordance with relevant EC Directives and national, regional and local environmental control regulations. For disposal within the EC, the appropriate code according to the European Waste Catalogue (EWC) should be used.

SECTION 14: Transport Information

U.S. Hazardous Materials Regulation (DOT 49CFR):

Not regulated except when shipped in bulk.

Bulk containers (>5 000 lbs) must be transported as:

ENVIRONMENTALLY HAZARDOUS SUBSTANCES, LIQUID, N.O.S. (Methylene Diphenyl Diisocyanate), Class 9, UN3082, PG III, RQ.

Canadian Transportation of Dangerous Goods (TDG):

Not regulated

ADR/RID:

Not Regulated

IMO Classification:

Not regulated

ICAO/IATA Classification:

Not regulated

SECTION 15: Regulatory information.

USA

TSCA Status:

All component substances of this mixture are listed on the TSCA inventory.

SARA Title III:

Sec. 313:

CERCLA RQ

Methylene diphenyl diisocyanate (MDI), 1% de minimis

Methylene diphenyl diisocyanate (MDI) 5 000 lbs (2270 kg)

California Proposition 65:

The component substances are not listed.

Canada

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

WHMIS Classification:

D1A: Immediate and serious toxic effects.

D2A: Material causing other toxic effects (due to respiratory sensitization).

NSNR Status:

All substances in this preparation are listed on the DSL.

NPRI Substances:

Polymethylene polyphenylene isocyanate and Methylene diphenyl diisocyanate (MDI) are NPRI reportable substances (Part I, Group I).

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SECTION 16: Other information

The information contained in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless it is specified in the text.

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End of Safety Data Sheet

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