



VISURON
TECHNOLOGIES, INC.

MATERIAL SAFETY DATA SHEET

Date Issued: 5/8/2013
MSDS: PolyArmor 52-39,
Part A

1. PRODUCT AND COMPANY IDENTIFICATION

Visuron Technologies, Inc.
900 McFarland 400 Boulevard
Alpharetta, GA 30004
770-815-4548

PRODUCT DESCRIPTION: Polyurea

PRODUCT CODE: PolyArmor 52-39, Part-A

GENERIC NAME: Isocyanate

24 Hour emergency response CHEMTREC 800-424-9300

2. HAZARDS IDENTIFICATION

PHYSICAL APPEARANCE: Clear straw color liquid.

IMMEDIATE CONCERNS: CAUTION: Contains DIPHENYLMETHANE DIISOCYANATE (CAS no. 101-68-8). Inhalation of MDI mists or vapors may cause respiratory irritation, breathlessness, chest discomfort and reduced pulmonary function. Overexposure well above the PEL may result in bronchitis, bronchial spasms and pulmonary edema. Long-term exposure to isocyanates has been reported to cause lung damage, including reduced lung function which may be permanent. Acute or chronic overexposure to isocyanates may cause sensitization in some individuals, resulting in allergic respiratory reactions including wheezing, shortness of breath and difficulty breathing.

POTENTIAL HEALTH EFFECTS

EYES: May cause significant irritation to the eyes.

SKIN: Allergic reaction and significant irritation to the skin is possible.

INGESTION: May cause significant irritation to the digestive tract.

INHALATION: Irritating to the nose, throat and respiratory tract.

SIGNS AND SYMPTOMS OF OVEREXPOSURE

ACUTE TOXICITY: Isocyanates have also been reported to cause hypersensitivity pneumonitis, which is characterized by flu-like symptoms, the onset of which may be delayed. Gastrointestinal symptoms include nausea, vomiting and abdominal pain.

CHRONIC EFFECTS: Results from a lifetime study in rats indicate that MDI aerosol was carcinogenic at 6 mg/m³, the highest dose tested. This is well above the recommended TLV of 5 ppb (0.05 mg/m³). Only irritation was noted at the lower concentration of 0.2 and 1 mg/m³. No birth defects of teratogenic effects were reported in a teratology study with rats exposed to 1, 4, and 12 mg/m³ polymeric MDI or 6 hr/day on days 6-15 of gestation. Embryotoxicity and fetotoxicity was reported at the top dose in the presence of maternal toxicity.

As a result of the previous repeated overexposures or single large dose, certain individuals will develop isocyanate sensitization (chemical asthma) which will cause them to react to later exposure to isocyanate at levels well below the PEL/TLV. 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. This increased lung sensitivity can persist for weeks and in severe cases for several years.

MEDICAL CONDITIONS AGGRAVATED: Individuals who are sensitized to isocyanates and those with asthma, respiratory disorder, skin allergies, and eczema.

SENSITIZATION: Possible sensitizer by inhalation and skin contact.

3. COMPOSITION / INFORMATION ON INGREDIENTS

Hazardous Components	CAS#	Weight %
Methylene Bis(phenylisocyanate) (MDI) (Containing 4,4'-Methylene bisphenyl Isocyanate CAS #101-68-8, 5873-54-1)	26447-40-5	35 - 50%
Homopolymer of Methylene Bis(phenylisocyanate)	096328-90-4	50 - 65%

COMMENTS: Criteria for listing components in this MSDS are as follows: Carcinogens are listed at 0.1% or greater; hazardous components according to OSHA 29 CFR 1910.1200 are listed at 1.0% or greater; non-hazardous components are not listed. This is not intended to be the complete compositional disclosure. Refer to section 15 for other regulatory information.

4. FIRST AID MEASURES

EYES: Immediately flush with plenty of water for two minutes. After initial flushing, remove any contact lenses and continue flushing for at least 15 minutes. Assure adequate flushing by separating the eyelids with fingers. Have eyes examined and tested by medical personnel.

SKIN: Remove contaminated clothing and immediately wash affected skin area with plenty of soap and water. Seek medical attention. Either discard or wash contaminated clothing and shoes before reuse.

INGESTION: Make sure victim is conscious and alert. If so, give 2-3 glasses of water to dilute. **DO NOT INDUCE VOMITING.** Never give anything by mouth to an unconscious person. Immediate medical attention is required. Do not leave victim unattended as spontaneous vomiting may occur. Lay victim on side with head lower than waist to prevent aspiration of swallowed product. If victim is conscious and vomiting occurs, give water to further dilute the chemical.

INHALATION: Remove victim to fresh air and provide oxygen if breathing is difficult. Seek medical attention if cough or other symptoms develop.

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: 200°C (392°F) Closed Cup

FLAMMABLE CLASS: Not Applicable

EXTINGUISHING MEDIA: Dry Chemical, Foam, or Carbon Dioxide. Water is not recommended do to reaction.

FIRE FIGHTING PROCEDURES: Do not release runoff from fire control methods to sewers or waterways.

FIRE FIGHTING EQUIPMENT: Firefighting personnel are required to use respiratory and eye protection. Full fire protective equipment (Bunker Gear) and self-contained breathing apparatus (SCBA) is recommended to be used for all indoor fires and any significant outdoor fires. SCBA may not be required for small outdoor fires that may easily be extinguished with a portable fire extinguisher.

HAZARDOUS DECOMPOSITION PRODUCTS: Oxides of Nitrogen, Oxides of Carbon.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on absorbent, such as diatomaceous earth, sawdust, vermiculite, or any appropriate readily available material and sweep or shovel absorbed

material into closed containers for disposal. After all visible traces, including ignitable vapors, have been removed thoroughly wash the contaminated area. Do not flush to sewer. If area of spill is porous, remove as much contaminated earth and gravel, etc. as necessary and place in closed containers for disposal.

Wear the appropriate personal protective equipment designated in Section 8, remove the leaking container to a containment area and place into an appropriate container to prevent any further spill.

LARGE SPILL: Construct temporary dikes of dirt or sand to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on absorbent, such as diatomaceous earth, sawdust, vermiculite, or any appropriate readily available material and sweep or shovel adsorbed material into closed containers for disposal. If area of spill is porous, remove as much contaminated earth and gravel, etc. as necessary and place in closed containers for disposal.

Wear the appropriate personal protective equipment designated in Section 8, close or cap leaking valves and/or block or plug hole in leaking container. Remove the leaking containers to a containment area and place into an appropriate container to prevent any further spill.

Contain material as described above and call the local fire, police, or appropriate emergency response provider for immediate emergency assistance.

ENVIRONMENTAL PRECAUTIONS

WATER SPILL: Construct temporary dikes of dirt, sand, or any appropriate readily available material to prevent spreading of material into sources of water.

GENERAL PROCEDURES: Absorb spill with an emergency spill kit, diatomaceous earth, saw dust or equivalent inert material. Shovel up and dispose of at an appropriate waste disposal facility following applicable laws and regulations.

7. HANDLING AND STORAGE

GENERAL PROCEDURES: Store product in original containers. Store container in a secure cool, dry, well-ventilated area at 55-85 deg. F. Opened containers should be blanketed with nitrogen gas at atmospheric pressure to avoid reaction with moisture. Contamination with moisture or "basic" compounds can cause dangerous pressure buildup in closed containers.

HANDLING: Use with sufficient ventilation to keep employee exposure below recommended limits. Provide adequate ventilation for storage, handling and use, especially for enclosed or low spaces. Avoid contact of liquid with eyes and prolonged skin exposure. Avoid breathing in vapors, mists, and aerosols. Do not allow product to contact open flame or electrical heating elements because dangerous decomposition products may form.

STORAGE: Store and warehouse product in an appropriate area or facility. Segregate like materials together to avoid negative chemical reactions. Protect materials from excessive exposure to heat. Observe proper storage conditions and temperatures.

STORAGE TEMPERATURE: (55°F) Minimum to (85°F) Maximum

COMMENTS: If bulging of containers occurs, transfer to a well-ventilated area and open carefully to relieve pressure then reseal.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Ventilation: Adequate ventilation required. Local exhaust may be required in some areas. Special exhausting generally not required. Mechanical exhaust usually adequate.

Eye Protection: Chemical tight goggles; full face shield if splashing is possible.

Skin Protection: Coveralls and impervious foot covering is recommended.

Other Protective Clothing or Equipment: Use impervious gloves, neoprene or rubber.

Work/ Hygienic Practices: Good air flow in working area. Eyewash station and safety shower should be available. Gloves and respiratory equipment should be worn at all times.

ENGINEERING CONTROLS: Proper industrial hygiene practices are required for workers and should be achieved through engineering controls including ventilation with a high turnover rate whenever feasible. When such controls are not available or not feasible to achieve full protection, respirators for workers (and others in the area) and other personal protective equipment is mandated. Exhaust air may need to be scrubbed (cleaned) or filtered to reduce environmental contamination and odors.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear safety goggles or safety glasses with side shields when handling and mixing this material.

SKIN: Wear impervious compatible chemical resistant protective clothing such as neoprene or butyl rubber gloves, aprons, boots or Tyvek coveralls, as appropriate to prevent contact with skin.

RESPIRATORY: For respirator selection and training, seek professional advice. Whenever workplace conditions require a use of a respirator, follow a respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements. Wear an OSHA/NIOSH approved respirator selected on its suitability to provide adequate worker protection for the chemicals used and given working conditions including the level of airborne contamination and presence of sufficient oxygen.

WORK HYGIENIC PRACTICES: Always follow "Good personal hygiene practices" when working with this material.

COMMENTS: Always practice "good personal hygiene" during and after use of this material, especially before eating, drinking, smoking, using the toilet, or applying cosmetics. DO NOT eat, drink, or smoke in work areas that contain hazardous chemicals.

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Liquid

ODOR: Faint aromatic odor.

COLOR: Clear to pale yellow

VAPOR PRESSURE: < 0.001 mmHg at 25°C

VAPOR DENSITY: N/D

FREEZING POINT: ~ (60°F)

FLASHPOINT AND METHOD: N/D

SOLUBILITY IN WATER: Insoluble in water, reacts with evolution of CO₂

SPECIFIC GRAVITY: 1N/D

VISCOSITY #1: N/D

(VOC): < 0.001 g/l

Notes: VOC listed on the MSDS is for this component only. Mixed VOC for the combined product may have a different value. Consult the manufacturer or product data sheet for final mixed product VOC value.

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: No

STABILITY: This material (product) is stable under normal ambient conditions of temperature and pressure. Follow recommendations for proper storage and use.

POLYMERIZATION: May occur if material is in contact with moisture.

CONDITIONS TO AVOID: Avoid high temperatures, sources of ignition, and moisture.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal oxidative decomposition of this product can produce CO, NO_x, HCN, and HDI vapors. Some curing agents will react to produce a large amount of heat.

INCOMPATIBLE MATERIALS: Water, strong bases, strong acids, strong oxidizing agents, alcohols and amines.

11. TOXICOLOGICAL INFORMATION

Toxicological Information for homopolymer of Methylenediphenyl Diisocyanate:

Acute Oral LD50: Estimated to be greater than 10,000 MG/KG (rats)

Acute Dermal LD50: > 2000 MG/KG (rabbits)

Skin Irritation

Rabbit, Draize, Slightly irritating

Eye Irritation

Rabbit, Draize, Slightly irritating

Sensitization

Dermal: sensitizer (guinea pig, Maximization Test (GPMT))

Dermal: non-sensitizer (guinea pig, Buehler)

Inhalation: non-sensitizer (guinea pig)

Repeated Dose Toxicity

3 wks inhalation: NOAEL: 3.7 – 4.3 mg/m³, (rat)

90days, inhalation: NOAEL: 3.3-3.4 mg/m³, (rat)

Irritation to lungs and nasal cavity.

Mutagenicity

AMES: negative (salmonella typhimurium, Metabolic Activation: with/without)

12. ECOLOGICAL INFORMATION

Ecological Data for Homopolymer of Methylenediphenyl Diisocyanate:

Biodegradation

0%, exposure time: 28 days, not readily biodegradable.

Acute and Prolonged Toxicity to Fish:

LC0: >100 mg/l (Zebra Fish (Brachydanio Rerio), 96 hrs)

Acute Toxicity to Aquatic Invertebrates:

EC0: >100 mg/l (water flea (Daphnia magna), 48 hrs)

Toxicity to Aquatic Plants:

EC50: >1,000 mg/l, (Green algae (Scenedesmus subspicatus), 72 hrs)

Toxicity to Microorganisms:

EC50: >1,000 mg/l, (Activated Sludge microorganisms, 3 hrs)

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: See the manufacturer's instructions to mix together with the proper components of multi-component materials, and allow to harden. Dispose solids at an appropriate waste disposal facility according to current applicable laws and regulations.

COMMENTS: Refer to Section 6. Accidental Release Measures for additional information.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)

PROPER SHIPPING NAME: Not Regulated

OTHER SHIPPING INFORMATION: Not a Dangerous Good according to the Australian Dangerous Goods (ADG) code. This material may be hazardous according to the criteria of NOHSC Australia.

AIR (ICAO/IATA)

SHIPPING NAME: Not Regulated

VESSEL (IMO/IMDG)

SHIPPING NAME: Not Regulated

CANADA TRANSPORT OF DANGEROUS GOODS

SHIPPING NAME: Not Regulated

15. REGULATORY INFORMATION

U.S. Federal Regulations

OSHA Hazcom Standard Rating: Hazardous

US Toxic Substances Control Act: All materials are listed on the TSCA inventory.

US EPA CERCLA Hazardous Substances (40 CFR 302):

Components: Methylene bisphenyl Isocyanate (MDI) CAS # 000101-68-8

SARA Section 311/312 Hazard Categories:

Acute health hazard, chronic health hazard, reactivity hazard.

US EPA Emergency Planning and Right-to-Know Act (EPCRA) ASARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A):

US EPA Emergency Planning and Right-to-Know Act (EPCRA) ASARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required:

Components: None

US EPA Resource Conservation and Recovery Act (RCRA) Composite list of Hazardous Wastes and Appendix VIII Hazardous Constituents (40 CFR 261):

If discarded in its purchased form, this product would not be a hazardous waste either by listing or by characteristic. However, under RCRA, it is the responsibility of the product user to determine at the time of disposal, whether a material containing the product or derived from the product should be classified as a hazardous waste. (40CFR 261.20-24)

State Right-to-Know Information

The following chemicals are specifically listed by individual states; other product specific health and safety data in other sections of the MSDS may also be applicable for state requirements. For details on your regulatory requirements you should contact the appropriate agency in your state.

Massachusetts, New Jersey or Pennsylvania right-to-know substance lists:

Weight%	Components	CAS number
20-40%	Methylene bisphenyl Isocyanate	000101-68-8

New Jersey environmental Hazardous Substances List and/or New Jersey right-to-know special hazardous substances list:

Weight%	Components	CAS number
<=0.5%	Methylene bisphenyl Isocyanate	000101-68-8

16. OTHER INFORMATION

NFPA 704M Rating

Health = 2

Fire = 1

Reactivity = 1

Other =

0= Insignificant 1 = Slight 2 = Moderate 3 = High 4 = Extreme

HMIS Rating

Health = 2*

Flammability = 1

Physical Hazard = 1

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

***= Chronic health hazard**

MANUFACTURER DISCLAIMER: This MSDS to the best of our knowledge conforms to the requirements of OSHA 29 CFR 1910.1200, 91/155/EEC and summarizes the health and safety hazard information and general guidance on how to safely handle the material at the date of issue. Each user must review the MSDS in the context of how the product will be handled and used in the workplace. If clarification or further information is needed to ensure that an appropriate risk assessment can be made, the user should contact this company. Responsibility for the product sold is subject to our standard terms and conditions, a copy of which is available upon request. This company warrants only that its products meet the specifications stated in the sales contract. Typical properties, where stated, are to be considered as representative of current production and should not be treated as specifications. While all the information presented in this document is believed to be reliable and to represent the best available data on these products, **NO GUARANTEE, WARRANTY, OR REPRESENTATION IS MADE, INTENDED, OR IMPLIED AS TO THE CORRECTNESS, OR SUFFICIENCY OF ANY INFORMATION, OR AS TO THE MERCHANTABILITY OR SUITABILITY OR FITNESS OF ANY CHEMICAL COMPOUNDS OR OTHER PRODUCTS FOR ANY PARTICULAR USE OR PURPOSE, OR THAT ANY CHEMICAL COMPOUNDS OR OTHER PRODUCTS OR THE USE THEREOF ARE NOT SUBJECT TO A CLAIM BY A THIRD PARTY FOR INFRINGEMENT OF ANY PATENT OR OTHER INTELLECTUAL PROPERTY RIGHT.** Some of the information presented and conclusions drawn herein are from sources other than direct test data on the product itself. Liability by this company for all claims, whether arising out of breach of warranty, negligence, strict liability, or otherwise, is limited to the purchase price of the material. Products may be toxic and require special precautions in handling. For all products listed, the user should obtain detailed information on toxicity, together with the proper shipping, handling and storage procedures, and comply with all applicable safety and environmental standards. Toxicity and risk characteristics of chemical compounds and other products may differ when used with other materials or in a manufacturing or other process. Those risk characteristics should be determined by the user and made known to handlers, processors, and end users.