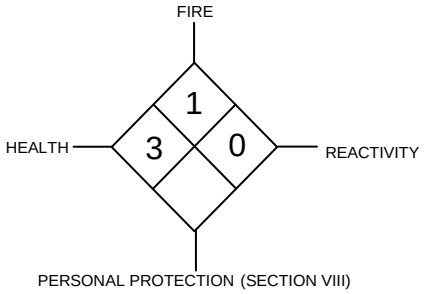
DATE: April 2, 2013
Supersedes: October 22, 2012

PRODUCT NAME: Z-7 HardCoat Resin



HMIS HAZARD RATING
LEAST---0 SLIGHT---- 1
MODERATE --- 2 HIGH ------- 3
EXTREME ---- 4

SECTION 1 - MANUFACTURER IDENTIFICATION

MANUFACTURER'S NAME: Pinnacle West Enterprises Inc.

ADDRESS: 31897 Mercantile Way, Abbotsford BC, V2T4C3

INFORMATION PHONE: 604-854-5968

EMERGENCY CONTACT: (CHEMTREC): **800-424-9300**

SECTION 2 –COMPOSITION & INGREDIENTS

SECTION 3 – Hazards Identification

Weight %	Ingredients	CAS #	OSHA PEL	ACGIH TLV
60 - 80	Glyceryl poly(oxypropylene) diamine	9046-10-0	N/E	
5 - 15	Glyceryl poly(oxypropylene) triamine	64852-22-8	N/E	
10 -20	Diethyltoluenediamine	68479-98-1	N/E	

*No toxic chemical(s) subject to the reporting requirements of Section 313 of Title III and of 40 CFR 372.

SECTION 4 – FIRST AID MEASURES

Emergency Overview:
Danger!
CAUSES EYE AND SKIN BURNS
HARMFUL IF SWALLOWED
CAUSES RESPIRATORY TRACT IRRITATION

Toxic if swallowed. Corrosive to eyes and skin. Causes chemical burns. Irritating to the respiratory system. Do Not breath vapor or mist. Do Not ingest. Do Not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Skin Contact: Frequent and prolonged contact will cause irritation and chemical burns. Skin sensitization and irritation may develop after repeated and/or prolonged contact with human skin.

Skin Absorption: Systematically toxic concentrations of this product may probably be absorbed through human skin.

Skin First Aid: Get Medical attention immediately. Wash material off of the skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Wash contaminated clothing and decontaminate footwear before reuse. Chemical burns must be treated promptly by a physician.

Eye Contact: Can induce irritation or chemical burns on contact with eyes.

Eye First Aid: Get medical attention immediately. Immediately flush eyes with plenty of water for a minimum of 15 minutes. After initial flushing, remove any contact lenses and continue flushing for at least an additional15 minutes. Have eyes examined and treated by medical personnel.

Ingestion: Swallowing small amounts of this material can create chemical burns and have harmful effects. Swallowing large amounts will be harmful. This is a toxic chemical.

Ingestion First Aid: Give 1 or 2 glasses of water to wash out mouth and do not induce vomiting. Call a physician immediately. (Never give anything by mouth to an unconscious person).

PRODUCT NAME: Z-7 HardCoat Resin

SECTION 4 – FIRST AID MEASURES CONTINUED

Inhalation: Vapors can irritate eyes, nose and respiratory passages. Overexposure may induce headache or dizziness. Severe overexposure to this material could cause stomach or intestinal upset, chronic cough, dizziness, or weakness.

Inhalation First Aid: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is labored, give oxygen. Consult medical personnel immediately.

Carcinogenicity:
NTP – No
IARC Monographs – No
OSHA Regulated – This material is considered hazardous by OSHA Hazardous Communication Standard (29 CFR 1910.1200)

Health Hazards: Acute: Exposure may cause skin and eye irritation, respiratory tract irritation. Chemical burns may result due to overexposure. Affects of exposure may be delayed.

Chronic: Repeated and prolonged exposure at low levels may result in adverse skin and eye effects, liver and kidney disorders. Following severe exposure the patient should be kept under medical review for at least 48 hours as delayed pulmonary oedema may develop.

SECTION 5 –FIRE FIGHTING MEASURES

Flash Point: 365 ^{0}F (185 ^{0}C) Closed Cup PMCC

Flammable Limits in Air by Volume: (Based on Diglycol) Lower: N/E Upper: N/E

Extinguishing Media: Dry chemical, alcohol foam, carbon dioxide.

Special Fire Fighting Protective Equipment: Wear NIOSH approved self contained breathing apparatus in positive pressure mode with full face piece. Boots, gloves (neoprene), goggles & full protective clothing are also required.

Unusual Fire and Explosion Hazards: Closed containers may rupture due to very high temperatures or induced pressure.

SECTION 6 – SPILLAGE, ACCIDENTAL RELEASE MEASURES

Steps To Be Taken In Case Material is Released Or Spilled: Keep all unnecessary personnel away from spill. Wear skin, eye, and respiratory protection during cleanup. Soak up material with absorbent and shovel into a chemical waste container. Cover container, but do not seal, and remove from work area. Residues from spill cleanup may continue to be regulated under provisions of RCRA and require storage and disposal as hazardous waste. For major spills, call CHEMTREC (Chemical Transportation Emergency Center) at 800-424-9300.

Disposal Method: Spill cleanup residues may still be subject to RCRA storage and disposal requirements. Dispose of in compliance with all relevant local, state, and federal laws and regulations regarding treatment.

SECTION 7 – HANDLING AND STORAGE

Precautions To Be Taken In Handling & Storing: Keep in cool, dry, ventilated storage area 60 to 100 ^{0}F (16 to 38 ^{0}C) , in closed container and out of direct sunlight. Keep liquid away from heat, sparks and flame, store in container above ground and surrounded by dikes to contain spills or leaks. Excessive heat or pressure may ignite or detonate even liquid product in the absence of sparks or open flames. Keep containers closed when not in use. Store in the original container or an approved alternate made from a compatible material. Label all containers. Containers, even those that have been emptied, may contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers. Do not pressurize to empty them.

Storage Precautions: Keep away from heat and sparks. Handling and Storage should be in accordance with local, State/Provincial or Federal regulations.

PRODUCT NAME: Z-7 HardCoat Resin

SECTION 8 – EXPOSURE CONTROLS AND PROTECTION INFORMATION

Ventilation: Use local exhaust ventilation to maintain airborne concentrations below TVL. Good general ventilation should be sufficient to control airborne levels.

Respiratory Protection: When spraying, use a NIOSH approved supplied air respirator as required to, prevent overexposure. In accordance with 29 CFR 1910.134, use either an atmosphere supplying respirator or and air purifying respirator for organic vapors.

SECTION 8 – EXPOSURE CONTROLS AND PROTECTION INFORMATION

Protective Clothing: Gloves determined to be impervious under the options of use such as nitrile gloves should be worn always when working with this product. Depending on conditions of use, additional protection may be reassured such as apron, arm covers, or full body suit. Wash contaminated clothing before wearing. Protective clothing should be selected and used in accordance with "Guidelines for the Selection of Chemical Protective Clothing" published by ACGIH.

Eye Protection: Chemical tight goggles

Other Protective Equipment: Unhindered access to safety shower and eye wash stations. As a general hygiene practice, wash hands and face after use. Showers and cleaning of clothes are recommended. Follow all label instructions. Educate and train employees in safe use of product.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Straw colored liquid, slight amine odor.

Solubility in Water: Partially in cold water

Boiling Point: Not Available

Melting Point: Not Available

Specific Gravity (H2O = 1): 1.04

PH: Approximately 10.5

Vapor Density (Air = 1): Heavier than air.

Evaporation Rate: Slower than ether.

Coating V.O.C.: 0 G/L (0 LB/GL)

V.O.C.s: None

Oxidizing Properties: Not Available

Specific Gravity: .95 to .99

SECTION 10 –STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid: Heat, high temperatures, open flame, sparks and moisture. Contact with incompatible materials in a closed system will cause buildup of pressure.

Incompatibility: Isocyanates and strong acids and oxidizers.

Hazardous Decomposition Products: Organic vapors and other thermal decomposition products.

Hazardous Polymerization: Will not occur.

PRODUCT NAME: Z-7 HardCoat Resin

SECTION 11 –TOXICOLOGICAL INFORMATION

Toxicity Data:

	Test	Results	Route	Species
Polyoxypropylenediamine	LD50	2090 mg/kg	Dermal	Rabbits
	LD50	480 mg/kg	Oral	Rat

Potential Acute Health Effects

Ingestion: Toxic if swallowed. May cause burns to the mouth, throat and stomach.
Inhalation: Irritating to the respiratory tract.
Eyes: Corrosive to the eyes. Causes burns.
Skin: Corrosive to the skin and causes burns.

Potential Chronic Health Effects

At this time it is Not Know if any significant effects or chronic hazards will occur.

SECTION 12 –ECOLOGICAL INFORMATION

No Data Available

SECTION 13 –DISPOSAL CONSIDERATIONS

Disposal Method: Spill cleanup residues may still be subject to RCRA storage and disposal requirements. Dispose of in compliance with all relevant local, state/provincial, and federal laws and regulations regarding treatment.

Waste disposal of substance: Incinerate in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:
Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

SECTION 14 –TRANSPORTATION INFORMATION

Land transport
USDOT

Proper Shipping Name: Amines, liquid, corrosive, N.O.S., (Polyoxypropylenediamine)
Hazard Class: 8
UN Number: UN2735
Packaging Group: III

Sea transport
IMDG

Proper Shipping Name: Amines, liquid, corrosive, N.O.S., (Polyoxypropylenediamine)
Hazard Class: 8
UN Number: UN2735
Packaging Group: III

Air transport
IATA/ICAO

Proper Shipping Name: Amines, liquid, corrosive, N.O.S., (Polyoxypropylenediamine)
Hazard Class: 8
UN Number: UN2735
Packaging Group: III

PRODUCT NAME: Z-7 HardCoat Resin

SECTION 15 –NATIONAL REGULATIONS AND REFERENCES

USA CLASSIFICATION
US inventory (TSCA 8b): All materials are listed or exempted.

TSCA (Toxic Substance Control Act) Regulations: All ingredients are on the TSCA Chemical Inventory.

EPCRA Section 313 (40 CFR 372): This product does not contain any chemicals subject to reporting requirements.
This product does not contain nor is it manufactured with ozone depleting substances.

California Prop 65: No ingredients listed.

Other Regulation/Legislation Which Apply To This Product: Massachusetts Right-to-Know, Pennsylvania Right-to-Know, New Jersey Right-to-Know.

CANADIAN CLASSIFICATION
This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all the information required by the CPR.

WHMIS: Class D-1B: Material causes immediate and serious toxic effects (toxic)

CEPA/Canadian Domestic Substance List (DSL): The substance(s) in this product is/are on the Canadian Domestic Substances List (CEPA DSL).

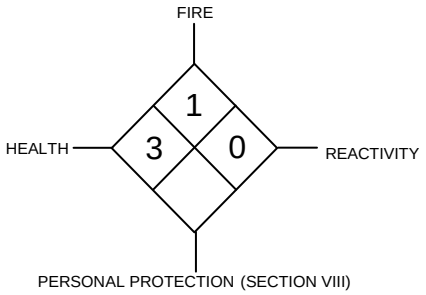
SECTION 16 –DISCLAIMER

Disclaimer: The data set forth in this sheet are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. Pinnacle West Enterprises Inc. makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereof.

DATE: April 2, 2013

Supersedes: October 22, 2012

PRODUCT NAME: Z-7 HardCoat Resin Black



HMIS HAZARD RATING
LEAST---0 SLIGHT---- 1
MODERATE --- 2 HIGH ------- 3
EXTREME ---- 4

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MANUFACTURER'S NAME: Pinnacle West Enterprises Inc.

ADDRESS: 31897 Mercantile Way, Abbotsford BC, V2T4C3

INFORMATION PHONE: 604-854-5968

EMERGENCY CONTACT: (CHEMTREC): **800-424-9300**

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SECTION 3 – Hazards Identification

Weight %	Ingredients	CAS #	OSHA PEL	ACGIH TLV
60 - 80	Glyceryl poly(oxypropylene) diamine	9046-10-0	N/E	
5 - 15	Glyceryl poly(oxypropylene) triamine	64852-22-8	N/E	
10 -20	Diethyltoluenediamine	68479-98-1	N/E	

*No toxic chemical(s) subject to the reporting requirements of Section 313 of Title III and of 40 CFR 372.

SECTION 4 – FIRST AID MEASURES

Emergency Overview:

Danger!
CAUSES EYE AND SKIN BURNS
HARMFUL IF SWALLOWED
CAUSES RESPIRATORY TRACT IRRITATION

Toxic if swallowed. Corrosive to eyes and skin. Causes chemical burns. Irritating to the respiratory system. Do Not breath vapor or mist. Do Not ingest. Do Not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Skin Contact: Frequent and prolonged contact will cause irritation and chemical burns. Skin sensitization and irritation may develop after repeated and/or prolonged contact with human skin.

Skin Absorption: Systematically toxic concentrations of this product may probably be absorbed through human skin.

Skin First Aid: Get Medical attention immediately. Wash material off of the skin with plenty of soap and water for at least 15 minutes. Remove contaminated clothing and shoes. Wash contaminated clothing and decontaminate footwear before reuse. Chemical burns must be treated promptly by a physician.

Eye Contact: Can induce irritation or chemical burns on contact with eyes.

Eye First Aid: Get medical attention immediately. Immediately flush eyes with plenty of water for a minimum of 15 minutes. After initial flushing, remove any contact lenses and continue flushing for at least an additional15 minutes. Have eyes examined and treated by medical personnel.

Ingestion: Swallowing small amounts of this material can create chemical burns and have harmful effects. Swallowing large amounts will be harmful. This is a toxic chemical.

Ingestion First Aid: Give 1 or 2 glasses of water to wash out mouth and do not induce vomiting. Call a physician immediately. (Never give anything by mouth to an unconscious person).

Inhalation: Vapors can irritate eyes, nose and respiratory passages. Overexposure may induce headache or dizziness. Severe overexposure to this material could cause stomach or intestinal upset, chronic cough, dizziness, or weakness.

PRODUCT NAME: Z-7 HardCoat Resin Black

SECTION 4 – FIRST AID MEASURES

Inhalation First Aid: Remove victim to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. If breathing is labored, give oxygen. Consult medical personnel immediately.

Carcinogenicity:
NTP – No
IARC Monographs – No
OSHA Regulated – This material is considered hazardous by OSHA Hazardous Communication Standard (29 CFR 1910.1200)

Health Hazards: Acute: Exposure may cause skin and eye irritation, respiratory tract irritation. Chemical burns may result due to overexposure. Affects of exposure may be delayed.

Chronic: Repeated and prolonged exposure at low levels may result in adverse skin and eye effects, liver and kidney disorders. Following severe exposure the patient should be kept under medical review for at least 48 hours as delayed pulmonary oedema may develop.

SECTION 5 –FIRE FIGHTING MEASURES

Flash Point: 365 ^{0}F (185 ^{0}C) Closed Cup PMCC

Flammable Limits in Air by Volume: (Based on Diglycol) Lower: N/E Upper: N/E

Extinguishing Media: Dry chemical, alcohol foam, carbon dioxide.

Special Fire Fighting Protective Equipment: Wear NIOSH approved self contained breathing apparatus in positive pressure mode with full face piece. Boots, gloves (neoprene), goggles & full protective clothing are also required.

Unusual Fire and Explosion Hazards: Closed containers may rupture due to very high temperatures or induced pressure.

SECTION 6 – SPILLAGE, ACCIDENTAL RELEASE MEASURES

Steps To Be Taken In Case Material is Released Or Spilled: Keep all unnecessary personnel away from spill. Wear skin, eye, and respiratory protection during cleanup. Soak up material with absorbent and shovel into a chemical waste container. Cover container, but do not seal, and remove from work area. Residues from spill cleanup may continue to be regulated under provisions of RCRA and require storage and disposal as hazardous waste. For major spills, call CHEMTREC (Chemical Transportation Emergency Center) at 800-424-9300.

Disposal Method: Spill cleanup residues may still be subject to RCRA storage and disposal requirements. Dispose of in compliance with all relevant local, state, and federal laws and regulations regarding treatment.

SECTION 7 – HANDLING AND STORAGE

Precautions To Be Taken In Handling & Storing: Keep in cool, dry, ventilated storage area 60 to 100 ^{0}F (16 to 38 ^{0}C) , in closed container and out of direct sunlight. Keep liquid away from heat, sparks and flame, store in container above ground and surrounded by dikes to contain spills or leaks. Excessive heat or pressure may ignite or detonate even liquid product in the absence of sparks or open flames. Keep containers closed when not in use. Store in the original container or an approved alternate made from a compatible material. Label all containers. Containers, even those that have been emptied, may contain explosive vapors. Do not cut, drill, grind, weld or perform similar operations on or near containers. Do not pressurize to empty them.

Storage Precautions: Keep away from heat and sparks. Handling and Storage should be in accordance with local, State/Provincial or Federal regulations.

PRODUCT NAME: Z-7 HardCoat Resin Black

SECTION 8 – EXPOSURE CONTROLS AND PROTECTION INFORMATION

Ventilation: Use local exhaust ventilation to maintain airborne concentrations below TVL. Good general ventilation should be sufficient to control airborne levels.

Respiratory Protection: When spraying, use a NIOSH approved supplied air respirator as required to, prevent overexposure. In accordance with 29 CFR 1910.134, use either an atmosphere supplying respirator or and air purifying respirator for organic vapors.

Protective Clothing: Gloves determined to be impervious under the options of use such as nitrile gloves should be worn always when working with this product. Depending on conditions of use, additional protection may be reassured such as apron, arm covers, or full body suit. Wash contaminated clothing before wearing. Protective clothing should be selected and used in accordance with "Guidelines for the Selection of Chemical Protective Clothing" published by ACGIH.

Eye Protection: Chemical tight goggles

Other Protective Equipment: Unhindered access to safety shower and eye wash stations. As a general hygiene practice, wash hands and face after use. Showers and cleaning of clothes are recommended. Follow all label instructions. Educate and train employees in safe use of product.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance and Odor: Black colored liquid, slight amine odor.

Solubility in Water: Partially in cold water

Boiling Point: Not Available

Melting Point: Not Available

Specific Gravity (H2O = 1): 1.04

PH: Approximately 10.5

Vapor Density (Air = 1): Heavier than air.

Evaporation Rate: Slower than ether.

Coating V.O.C.: 0 G/L (0 LB/GL)

V.O.C.s: None

Oxidizing Properties: Not Available

Specific Gravity: .95 to .99

SECTION 10 –STABILITY AND REACTIVITY

Stability: Stable under normal conditions.

Conditions to Avoid: Heat, high temperatures, open flame, sparks and moisture. Contact with incompatible materials in a closed system will cause buildup of pressure.

Incompatibility: Isocyanates and strong acids and oxidizers.

Hazardous Decomposition Products: Organic vapors and other thermal decomposition products.

Hazardous Polymerization: Will not occur.

PRODUCT NAME: Z-7 HardCoat Resin Black

SECTION 11 –TOXICOLOGICAL INFORMATION

Toxicity Data:

	Test	Results	Route	Species
Polyoxypropylenediamine	LD50	2090 mg/kg	Dermal	Rabbits
	LD50	480 mg/kg	Oral	Rat

Potential Acute Health Effects

Ingestion:	Toxic if swallowed. May cause burns to the mouth, throat and stomach.
Inhalation:	Irritating to the respiratory tract.
Eyes:	Corrosive to the eyes. Causes burns.
Skin:	Corrosive to the skin and causes burns.

Potential Chronic Health Effects

At this time it is Not Know if any significant effects or chronic hazards will occur.

SECTION 12 –ECOLOGICAL INFORMATION

No Data Available

SECTION 13 –DISPOSAL CONSIDERATIONS

Disposal Method: Spill cleanup residues may still be subject to RCRA storage and disposal requirements. Dispose of in compliance with all relevant local, state/provincial, and federal laws and regulations regarding treatment.

Waste disposal of substance: Incinerate in a licensed facility. Do not discharge substance/product into sewer system.

Container disposal:
Dispose of in a licensed facility. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.

SECTION 14 –TRANSPORTATION INFORMATION

Land transport
USDOT

Proper Shipping Name:	Amines, liquid, corrosive, N.O.S., (Polyoxypropylenediamine)
Hazard Class:	8
UN Number:	UN2735
Packaging Group:	III

Sea transport
IMDG

Proper Shipping Name:	Amines, liquid, corrosive, N.O.S., (Polyoxypropylenediamine)
Hazard Class:	8
UN Number:	UN2735
Packaging Group:	III

Air transport
IATA/ICAO

Proper Shipping Name:	Amines, liquid, corrosive, N.O.S., (Polyoxypropylenediamine)
Hazard Class:	8
UN Number:	UN2735
Packaging Group:	III

PRODUCT NAME: Z-7 HardCoat Resin Black

SECTION 15 –NATIONAL REGULATIONS AND REFERENCES

USA CLASSIFICATION
US inventory (TSCA 8b): All materials are listed or exempted.

TSCA (Toxic Substance Control Act) Regulations: All ingredients are on the TSCA Chemical Inventory.

EPCRA Section 313 (40 CFR 372): This product does not contain any chemicals subject to reporting requirements.
This product does not contain nor is it manufactured with ozone depleting substances.

California Prop 65: No ingredients listed.

Other Regulation/Legislation Which Apply To This Product: Massachusetts Right-to-Know, Pennsylvania Right-to-Know, New Jersey Right-to-Know.

CANADIAN CLASSIFICATION
This product has been classified in accordance with the hazard criteria of the CPR (Controlled Products Regulations) and this MSDS (Material Safety Data Sheet) contains all the information required by the CPR.

WHMIS: Class D-1B: Material causes immediate and serious toxic effects (toxic)

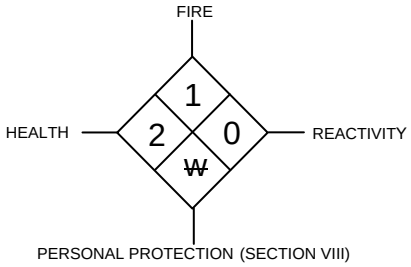
CEPA/Canadian Domestic Substance List (DSL): The substance(s) in this product is/are on the Canadian Domestic Substances List (CEPA DSL).

SECTION 16 –DISCLAIMER

Disclaimer: The data set forth in this sheet are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereof.

Date: April 2, 2013
Supersedes Date: October 22, 2012

PRODUCT NAME: Z-7 HardCoat Iso



HMIS HAZARD RATING
LEAST---0 SLIGHT---- 1
MODERATE --- 2 HIGH ------- 3
EXTREME ---- 4

SECTION 1 – SUBSTANCE/PREPARATION AND COMPANY IDENTIFICATION

MANUFACTURER'S NAME: Pinnacle West Enterprises Inc.

ADDRESS: 31897 Mercantile Way, Abbotsford BC, V2T4C3

INFORMATION PHONE: 604-854-5968

EMERGENCY CONTACT: (CHEMTREC): **800-424- 9300**

SECTION 2 –COMPOSITION & INGREDIENTS

CAS Number	Content (W/W)	Chemical name
101-68-8	45 - 55 %	Diphenylmethane-4,4'-diisocyanate (MDI)
	< 55.0 %	Isocyanate Prepolymer
26447-40-5	< 5.0 %	MDI Mixed Isomers
27554-26-3	<10%	Diisooctyl Phthalate

Section 313 Supplier Notification
This product contains the following EPCRA section 313 chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372): Diisocyanate Compounds (Category Code N120)

4,4' - MDI	101-68-8	45-55%	0.005 ppm

SECTION 3 – Hazards Identification

Emergency overview

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 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

Primary routes of exposure

Routes of entry for solids and liquids include eye and skin contact, ingestion and inhalation. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquified gases.

Acute toxicity:

Information on: MDI
Inhalation of MDI vapors may cause irritation of the mucous membranes of the nose, throat or trachea, breathlessness, chest discomfort, difficult breathing and reduced pulmonary function. Airborne overexposure well above the PEL may result additionally in eye irritation, headache, chemical bronchitis, asthma-like findings or pulmonary edema.
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.

PRODUCT NAME: Z-7 HardCoat Iso

SECTION 3 – Hazards Identification Continued

Irritation:
Information on: Diisocyanates
Eye contact with isocyanates may result in conjunctival irritation and mild corneal opacity. Skin contact may result in dermatitis, either irritative or allergic.

Repeated dose toxicity:
Information on: MDI
Results from a lifetime inhalation 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 or teratogenic effects were reported in a teratology study with rats exposed to 1, 4, and 12 mg/m3
polymeric MDI for 6 hr/day on days 6-15 of gestation. Embryotoxicity and fetotoxicity was reported at the top dose in the presence of maternal toxicity.

Information on: Isocyanates
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 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. 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 a decrease in lung function, which may be permanent.
Sensitization may be either temporary or permanent. Prolonged contact 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.

Medical conditions aggravated by overexposure:
Medical supervision of all employees who handle or come into contact with isocyanates is recommended. The isocyanate component is a respiratory sensitizer. It may cause allergic reaction leading to asthma-like spasms of the bronchial tubes and difficulty in breathing.
Pre-employment and periodic medical examinations with respiratory function tests (FEV, FVC as a minimum) are suggested.
Persons with history of respiratory disease or hypersensitivity should not be exposed to this product. Persons with asthmatic conditions, chronic bronchitis, other chronic respiratory diseases, recurrent eczema or pulmonary sensitization should be excluded from working with isocyanates. Once a person is diagnosed as having pulmonary sensitization (allergic asthma) to isocyanates, further exposure is not recommended. An animal study indicated that MDI may induce respiratory hypersensitivity following dermal exposure.

SECTION 4 – FIRST AID MEASURES

General advice:
Remove contaminated clothing.
If inhaled:
Remove the affected individual into fresh air and keep the person calm. Assist in breathing if necessary. Immediate medical attention required.
If on skin:
Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention.

SECTION 4 – FIRST AID MEASURES

PRODUCT NAME: Z-7 HardCoat Iso

Note to physician
Antidote: Specific antidotes or neutralizers to isocyanates do not exist.
Treatment: Treatment should be supportive and based on the judgment of the physician in response to the reaction of the patient.

SECTION 5 –FIRE FIGHTING MEASURES

Flash point: > 110 °C (230 F) (Pensky Closed Cup)

Autoignition: >600°C

Suitable extinguishing media: water, dry extinguishing media, carbon dioxide, foam

Hazards during fire-fighting: nitrous gases, fumes/smoke, isocyanate, vapour

Protective equipment for fire-fighting: Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

SECTION 6 – SPILLAGE, ACCIDENTAL RELEASE MEASURES

Steps To Be Taken In Case Material Is Released Or Spilled:.

Personal precautions:
Clear area. Ensure adequate ventilation. Wear suitable personal protective clothing and equipment.

Environmental precautions:
Do not discharge into drains/surface waters/groundwater.

Cleanup:
Dike spillage.

For small amounts: Absorb isocyanate with suitable absorbent material (see § 40 CFR, sections 260, 264 and 265 for further information). Shovel into open container. Do not make container pressure tight. Move container to a well-ventilated area (outside). Spill area can be decontaminated with the following recommended decontamination solution: Mixture of 90 % water, 8 % concentrated ammonia, 2 % detergent. Add at a 10 to 1 ratio. Allow to stand for at least 48 hours to allow escape of evolved carbon dioxide.
For large amounts: If temporary control of isocyanate vapor is required, a blanket of protein foam or other suitable foam (available from most fire departments) may be placed over the spill. Transfer as much liquid as possible via pump or vacuum device into closed but not sealed containers for disposal.
For residues: The following measures should be taken for final cleanup: Wash down spill area with decontamination solution. Allow solution to stand for at least 10 minutes.

SECTION 7 – HANDLING AND STORAGE

PRODUCT NAME: Z-7 HardCoat Iso

Handling
General advice:
Mix thoroughly before use. If bulging of drum occurs, transfer to well ventilated area, puncture to relieve pressure, open vent and let stand for 48 hours before resealing.
Protection against fire and explosion: No explosion proofing necessary.

Storage
General advice:
Keep container tightly closed and in a well-ventilated place. Outage of containers should be filled with dry inert gas at atmospheric pressure to avoid reaction with moisture. Formation of CO2 and build up of pressure possible.
Storage incompatibility:
General: Segregate from bases.
Storage stability:
Storage temperature: 80 - 95 °F
Protect against moisture.

SECTION 8 – EXPOSURE CONTROLS AND PROTECTION INFORMATION

Components with workplace control parameters

Diphenylmethane-4,4'-diisocyanate (MDI)	OSHA	CLV 0.02 ppm 0.2 mg/m3 ;
	ACGIH	TWA value 0.005 ppm ;

Advice on system design:
Provide local exhaust ventilation to maintain recommended P.E.L.

Personal protective equipment

Respiratory protection:
For situations where the airborne concentrations may exceed the level for which an air purifying respirator is effective, or where the levels are unknown or Immediately Dangerous to Life or Health (IDLH), use NIOSH certified full face piece pressure demand self-contained breathing apparatus (SCBA) or a full face piece pressure demand supplied-air respirator (SAR) with escape provisions. When atmospheric levels may exceed the occupational exposure limit (PEL or TLV) NIOSH-certified air-purifying respirators equipped with an organic vapor sorbent and particulate filter can be used as long as appropriate precautions and change out schedules are in place.

Hand protection:
Chemical resistant protective gloves, Suitable materials, chloroprene rubber (Neoprene), chlorinated polyethylene, polyvinyl chloride (Pylox), butyl rubber, fluoroelastomer (Viton), nitrile rubber (Buna N)

Eye Wear

Eye protection:
Tightly fitting safety goggles (chemical goggles). Wear face shield if splashing hazard exists.
Body protection:
Suitable materials, saran-coated material
General safety and hygiene measures:
Wear protective clothing as necessary to prevent contact. Eye wash fountains and safety showers must be easily accessible. Observe the appropriate PEL value. Wash soiled clothing immediately. Contaminated equipment or clothing should be cleaned after each use or disposed of.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

PRODUCT NAME: Z-7 HardCoat Iso

Form: liquid
Odor: aromatic, faint odour
Color: colorless to light yellow
PH value: No data available.
Bulk density: 9.92 lb/USg (25 °C)
Viscosity, dynamic: 180 – 250 cps (25 °C)
Miscibility with water: Reacts with water

Specific Gravity (H20 = 1): 1.19 @ 77^0 F
Boiling Point: 406^0 F.
Evaporation Rate:
Vapor Density: 8.5 approx
Coating V.O.C.: None
Solubility in Water: Reacts with water
V.O.C.s: None
Feezing Point: 41^0F

SECTION 10 –STABILITY AND REACTIVITY

Conditions to avoid: Avoid moisture.

Substances to avoid: water, alcohols, strong bases, Substances/products that react with isocyanates.
Hazardous reactions: The product is chemically stable. Reacts with water, with formation of carbon dioxide. Risk of bursting. Reacts with alcohols. Reacts with acids. Reacts with alkalies. Reacts with amines. Risk of exothermic reaction. Risk of violent reaction. Risk of polymerization. Contact with certain rubbers and plastics can cause brittleness of the substance/product with
subsequent loss in strength.
Decomposition products: Hazardous decomposition products: carbon monoxide, hydrogen cyanide, nitrogen oxides, aromatic isocyanates, gases/vapours

Thermal decomposition: No data available.

Corrosion to metals: No corrosive effect on metal.

Stability: Store at 70 deg F to 120 deg F.

SECTION 11 –TOXICOLOGICAL INFORMATION

Acute toxicity
Oral:
LD50/rat: > 10,000 mg/kg
Practically nontoxic.
Inhalation:
LC50/rat:
LC50/rat: / 4 h
LC50/rat: / 4 h
LC50/rat: 2.240 mg/l / 1 h
Moderately toxic.

SECTION 12 –ECOLOGICAL INFORMATION

Environmental toxicity

Acute and prolonged toxicity to fish:

static
zebra fish/LC50 (24 h): > 500 mg/l
Practically nontoxic.
Chronic toxicity to aquatic invertebrates:
Daphnia magna EC50 (24 h) > 500 mg/l
Practically nontoxic.

SECTION 13 –DISPOSAL CONSIDERATIONS

Waste disposal of substance:
Incinerate or dispose of in a licensed facility.
Do not discharge substance/product into sewer system.
Container disposal:
Steel drums must be emptied and can be sent to a licensed drum re conditioner for reuse, a scrap metal dealer or an approved landfill. Refer to 40 CFR § 261.7 (residues of hazardous waste in empty containers).
Decontaminate containers prior to disposal. Recommend crushing, puncturing or other means to prevent unauthorized use of used containers.
Decontamination solution: Mixture of 90% water, 8% ammonia and 2% liquid soap. Mix the solution and mist into empty container using hand sprayer. Leave screw caps off to avoid any pressure build from co2 release.

SECTION 14 –TRANSPORTATION INFORMATION

Land transport
USDOT
Not classified as a dangerous good under transport regulations

Sea transport
IMDG
Not classified as a dangerous good under transport regulations

Air transport
IATA/ICAO
Not classified as a dangerous good under transport regulations

SECTION 15 –NATIONAL REGULATIONS AND REFERENCES

Federal Regulations

Registration status:

PRODUCT NAME: Z-7 HardCoat Iso

TSCA, US released / listed

OSHA hazard category: ACGIH TLV established, Highly toxic - inhalation, OSHA PEL established, Sensitizer, Acute target organ effects reported, Skin and/or eye irritant, Chronic target organ effects reported

CERCLA RQ	CAS Number	Chemical name
5,000 LBS	101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)

SARA hazard categories (EPCRA 311/312): Chronic, Acute

SARA 313:

CAS Number	Chemical name
	Diisocyanates Compound Category

State regulations
State RTK

CAS Number	Chemical name	State RTK
101-68-8	Diphenylmethane-4,4'-diisocyanate (MDI)	MA, NJ, PA

SECTION 16 –DISCLAIMER

Disclaimer: The data set forth in this sheet are based on information provided by the suppliers of the raw materials and chemicals used in the manufacture of the aforementioned product. Pinnacle West Enterprises Inc. makes no warranty with respect to the accuracy of the information provided by their suppliers, and disclaims all liability of reliance thereof.