

# Material Safety Data Sheet

Material Name: PENNCOAT® 210X HARDENER

ID:

## \*\*\* Section 1 - Chemical Product and Company Identification \*\*\*

Product Trade Name PENNCOAT 210X HARDENER

### Manufacturer Information

Ergon Armor

(601) 933-3540

Corrosion Engineering

300 Stevens Drive, Suite 310

(800) 424-9300

Lester, PA 19113

## \*\*\* Section 2 - Composition / Information on Ingredients \*\*\*

CAS #	Component	Percent	OSHA
9046-10-0	Polyoxypropylenediamine	15-20	Yes
111-40-0	Diethylenetriamine	5-15	Yes
140-31-8	Aminoethylpiperazine	10-20	Yes
68479-04-9	1,3-Propanediamine, N-[3-(tridecyloxy)propyl]-, branched	20-30	Yes
84852-15-3	Phenol, 4-nonyl-, branched	10-20	Yes
80-05-7	Diphenylolpropane	5-15	Yes

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Communication Standard (29 CFR 1910.1200)

The components of this product are all on the TSCA inventory list.

## \*\*\* Section 3 - Hazards Identification \*\*\*

### Emergency Overview:

Clear light medium viscosity liquid with slight amine odor

DANGER!

CAUSES EYE AND SKIN BURNS. MAY CAUSE BLINDNESS.

MAY BE HARMFUL IF ABSORBED THROUGH SKIN

MAY CAUSE ALLERGIC RESPIRATORY REACTION.

MAY CAUSE ALLERGIC SKIN REACTION.

MAY BE HARMFUL IF SWALLOWED.

### Potential Health Effects:

#### Diethylenetriamine

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Repeated or prolonged skin contact can result in an allergic skin reaction. Overexposure to vapor or mist may be irritating to eyes and respiratory tract and repeated or prolonged exposure can cause an allergic respiratory tract reaction in susceptible individuals. While swallowing of this material is unlikely in the industrial setting, if swallowed this material may cause burns of the mouth, throat and digestive tract. This material is considered, on the basis of single exposure (acute) animal tests, to be slightly toxic if ingested (swallowed), moderately to slightly toxic if absorbed through skin and corrosive to

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eyes and skin. Due to the potential for this material to cause irritation and an allergic reaction in the respiratory tract, workers with lung disease or diminished respiratory capacity should have limited exposure to this material.

## **Aminomethylpiperazine**

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Liquid contact with skin or eyes may cause corrosive tissue damage with scarring or permanent eye damage. Inhalation of vapor may be irritating to the upper respiratory tract. Repeated exposure may cause allergic reaction in sensitive individuals. This material is considered, based on single exposure (acute) animal studies, to be slightly toxic after ingestion (swallowing), moderately toxic after skin contact, non-toxic after inhalation, corrosive to skin and severely irritating to eyes.

## **Polyoxypropylenediamine**

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Contact of liquid with eyes and skin may cause redness, swelling, pain and burns. Exposure to vapors or mists of this material may be irritating with nasal discharge, coughing and nose and throat discomfort. This material is considered, on the basis of single exposure (acute) animal tests, to be slightly to moderately toxic if ingested (swallowed) or absorbed through skin and corrosive to eyes and skin. While swallowing of this material is unlikely in the industrial setting, if swallowed this material may cause burns of the mouth, throat and digestive tract.

## **Diphenylolpropane**

Skin contact and inhalation are expected to be the primary routes of occupational exposure to this material. The most common adverse effect of workplace exposure to this material is allergic skin reaction which results in rashes (dermatitis). Overexposure to dusts may result in eye and upper respiratory tract irritation, hoarseness and headaches. This material is considered, on the basis of single exposure (acute) animal tests, to be moderately irritating to eyes and slightly to moderately irritating to skin.

### **\*\*\* Section 4 - First Aid Measures \*\*\***

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.

IF ON SKIN, immediately wash with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

### **\*\*\* Section 5 - Fire Fighting Measures \*\*\***

<b>Flash Point:</b>	>212 deg F (100 deg C)	<b>Method Used:</b>	TCC	<b>Flammability Classification:</b>
<b>Upper Flammable Limit (UFL):</b>	6%	<b>Lower Flammable Limit (LFL):</b>	1%	

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## Fire & Explosion Hazards:

Closed containers of this material may explode when subjected to heat from surrounding fire. Cool exposed containers with water. Avoid breathing fumes from fire exposed material.

## Extinguishing Media:

Use water spray, carbon dioxide, foam or dry chemical.

## Fire-Fighting Instructions:

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

## \* \* \* Section 6 - Accidental Release Measures \* \* \*

## Spill or Leak

Isolate hazard area and deny entry to unnecessary or unprotected personnel. Contain spilled liquid with sand or earth. Clean up spill immediately, observing precautions in the Personal Protection section of MSDS. Avoid runoff into storm sewers and ditches which lead to waterways.

## \* \* \* Section 7 - Handling and Storage \* \* \*

## Handling Procedures:

Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Empty container may contain hazardous residues.

## Storage Procedures:

Avoid excessive heat. Store out of direct sunlight in a cool, well-ventilated place.

## \* \* \* Section 8 - Exposure Controls / Personal Protection \* \* \*

## Component Exposure Limits

-Only those components with exposure limits are printed in this section.

### Diethylenetriamine

ACGIH:	TLV-TWA 4.2 mg/m <sup>3</sup> , 1 ppm
ACGIH (SKIN DESIGNATOR):	Y
OSHA:	PEL-TWA 4.2 mg/m <sup>3</sup> , 1 ppm
OSHA (SKIN DESIGNATOR):	Y

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-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.

-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.

## Engineering Controls:

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see above). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

## PERSONAL PROTECTIVE EQUIPMENT

As prescribed in the OSHA Standard for Personal Protective Equipment (29 CFR 1910.132), employers must perform a Hazard Assessment of all workplaces to determine the need for, and selection of, proper protective equipment for each task performed.

### Eyes/Face Protective Equipment:

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment available.

### Skin Protection:

Neoprene or Polyvinyl chloride gloves should be worn when handling this material. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Wash contaminated clothing and clean protective equipment before reuse. Rinse contaminated skin promptly. Wash skin thoroughly after handling.

### Respiratory Protection:

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

## \* \* \* Section 9 - Physical & Chemical Properties \* \* \*

**Physical State:** Liquid  
**Odor:** Amine  
**Vapor Density:** 3.5  
**Melting Point:** N/E  
**pH:** N/A  
**VOC:** <1%

**Appearance:** Yellow-amber liquid  
**Vapor Pressure:** <1 mg/Hg @ 20 deg C  
**Boiling Point:** >400 deg F  
**Specific Gravity:** 1.03 @ 25/25 Deg C  
**Viscosity:** NE  
**Solubility Water:** Partially soluble

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## \*\*\* Section 10 - Chemical Stability & Reactivity Information \*\*\*

### Chemical Stability:

This material is chemically stable under normal and anticipated storage and handling conditions.

### Incompatibility:

Avoid contact with strong acids, alkalis, oxidizers, copper, copper alloys, chlorinated compounds and epoxy resins (in uncontrolled conditions).

### Decomposition Products:

Oxides of carbon and nitrogen.

### Hazardous Polymerization:

Hazardous polymerization is not known to occur.

## \*\*\* Section 11 - Toxicological Information \*\*\*

### Acute Toxicity:

#### A: General Product Information

No information available for the product.

#### B: Component Analysis –

Data on this material and/or its components are summarized below.

#### Polyoxypropylenediamine

Single exposure (acute) studies indicate that this material is slightly to moderately toxic to rats if swallowed (LD50 >50-2,880 mg/kg) or to rabbits if absorbed through skin (LD50 980-3,000 mg/kg), and severely irritating to corrosive to rabbit eyes (80.0-110.0/110.0) and skin (4.6-8.0/8.0). No skin allergy was observed in guinea pigs following repeated exposure to this material using the Buehler method; however, allergic skin reactions were observed in guinea pigs using the Magnusson & Kligman method.

#### Diethylenetriamine

Single exposure (acute) studies indicate that this material is slightly toxic to rats if swallowed (LD50 1,080-2,330 mg/kg), moderately to slightly toxic to rabbits if absorbed through skin (LD50 670-1,090 mg/kg), and corrosive to rabbit eyes and skin. No deaths were observed in rats exposed to saturated vapor for 8-hours. Allergic skin and respiratory tract reactions have been observed in humans following repeated exposure to this material. Rats orally administered up to 50,000 ppm for 14-days showed decreased body weight, food consumption and spleen weights. Decreased body weight and increased liver, kidney and brain weights were seen in rats

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administered up to 1060 mg/kg/day by gavage or 15,000 ppm in the diet daily for 90-days. Lifetime dermal exposure to rats produced effects on the liver, lungs, kidneys, spleen and adrenal glands. No tumors were seen in mice after lifetime dermal application. No adverse effects were observed in the offspring of rats exposed subcutaneously (10 or 50 mg/kg/day) or dermally (0.4 ml) for life. This material has generally produced no genetic changes in standard tests using bacterial and animal cells and animals, although a few positive results have been observed in standard tests using bacterial and animal cells.

## **Aminoethylpiperazine**

Single exposure (acute) studies indicate that this material is slightly toxic to rats if swallowed (LD50 2,140 mg/kg), moderately toxic to rabbits if absorbed through skin (LD50 880 mg/kg), practically non-toxic to rabbits if inhaled (8-hr exposure, no deaths), and corrosive to rabbit eyes and skin. Skin allergy was observed in guinea pigs following repeated skin exposure to this material. This material has not produced genetic changes in bacterial and mammalian cell assays, but was found to transform mammalian cells in culture.

## **Diphenylolpropane**

Allergic skin reactions from repeated contact with these type resins are well documented in the literature. In affected workers, these skin rashes may be recurrent and require removal from exposure. A few case reports and studies in mice indicate that the allergic response may be aggravated by exposure to sunlight. Repeated exposure of rats to aerosols of this material (up to 150 mg/m<sup>3</sup>) resulted in irritant effects and decreased body weight gain; no evidence of systemic toxicity was found. Dietary administration of this material to rats for 14 days at dose levels up to 12,000 ppm also resulted in decreased body weight gain; no deaths or gross lesions were observed. No effects were seen in dogs fed the same dose levels. The National Toxicology Program has conducted long-term (2-year) feeding studies in mice and rats. No evidence for carcinogenicity was seen in either sex. No increase in birth defects was found in the offspring of mice and rats given this material orally during pregnancy, even at levels that were toxic to the mothers. A slight decrease in sperm motility was observed in male mice exposed to this material. Administration of this material via silastic implant did not affect reproduction or fertility in mice. In another continuous breeding protocol study where this material was administered in the diet, evidence for reduced reproduction ability included reduced numbers of litters and live pups per litter. Other signs of toxicity in treated mice included liver and kidney damage. This material did not produce genetic changes in standard tests with bacterial or animal cells or in a dominant lethal assay in mice.

Single exposure (acute) studies indicate the following:

Oral - Slightly Toxic to Rats (LD50 2,000-4,000 mg/kg)

Dermal - Slightly Toxic to Rabbits (LD50 3,000 mg/kg)

Eye Irritation - Moderately Irritating to Rabbits

Skin Irritation - Slightly to Moderately Irritating to Rabbits and Guinea Pigs

## **Component Carcinogenicity**

None of this product's components are listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

## **Chronic Toxicity**

No information available for the product.

## **Epidemiology:**

No information available for the product.

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## Neurotoxicity:

No information available for the product.

## Mutagenicity:

No information available for the product.

## Teratogenicity:

No information available for the product.

*** Section 12 - Ecological Information ***
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## Ecotoxicity:

### A: General Product Information

No information available for the product.

### B: Component Analysis - Ecotoxicity - Aquatic Toxicity

Data on this material and/or its components are summarized below.

#### Diethylenetriamine

24-hr TLm Brine shrimp: 710 mg/l  
24-hr TLm Himehada: 1,000 mg/l  
48-hr LC50 Daphnia magna: 11.5-17.0 mg/l, Slightly Toxic  
48-hr LC50 Golden orfe (static): 100-500 mg/l, Practically Non-toxic  
96-hr LC50 Fathead minnow: 258-332 mg/l, Practically Non-toxic  
Bacterial Inhibition (IC50): >5,000 mg/l

#### Aminoethylpiperazine

Fathead minnows: LC50 2190 mg/l, Practically Non-toxic

#### Diphenylolpropane

Freshwater Studies  
48-hr LC50 Daphnia magna: 10 mg/l, Moderately Toxic  
96-hr LC50 Algae: 2.7 mg/l, Moderately Toxic  
96-hr LC50 Fathead minnow: 4.7 mg/l, Moderately Toxic

## Environmental Fate:

Data on this material and/or its components are summarized below.

#### Diethylenetriamine

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This material has a theoretical oxygen demand (ThOD) of 1.55 mg/mg and a chemical oxygen demand (COD) of 1.57 mg/mg. Its 20-day biochemical oxygen demand (BOD) is 0% (non-acclimated) and 70% (acclimated). Due to its high water solubility and low octanol/water partition coefficient (Kow = 0.11), this material is not expected to bioconcentrate.

## Diphenylolpropane

This material was evaluated in a 30-day semi-continuous activated sludge (SCAS) test without acclimation. Primary degradation was between 87% and 95% in the SCAS test. This material was graded by 90% in 4 days in natural waters collected downstream from the discharge point.

### \*\*\* Section 13 - Disposal Considerations \*\*\*

#### US EPA Waste Numbers & Descriptions:

##### A: General Product Information

Recover, reclaim or recycle when practical.

Disposal via incineration is recommended. Appropriate pretreatment and disposal in an authorized landfill is acceptable. In all cases, dispose of material in accordance with all applicable federal, state, and local laws and regulations. Consult appropriate regulatory officials or your attorney for information on such disposal.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

##### B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

### \*\*\* Section 14 - Transportation Information \*\*\*

#### US DOT Information

DOT Name: Polyamines, Liquid, Corrosive, NOS  
DOT Technical Name: (Diethylenetriamine, N-Aminoethyl Piperazine)  
DOT Hazard Class: 8  
UN Number: 2735  
DOT Packing Group: PG III

### \*\*\* Section 15 - Regulatory Information \*\*\*

#### US Federal Regulations

##### A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

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## B: Component Analysis

### SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR Part 372. See Section 2

N/A

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of SARA Section 302 (40 CFR 355 Appendix A or CERCLA (40 CFR 302.4).

N/A

**SARA 311/312:** Acute: Y Chronic: Y Fire: N Pressure: N Reactive: N

### CERCLA Reportable Quantities (40 CFR 302.4):

NE

## State Regulations

### A: General Product Information

No additional information available.

### B: Component Analysis – State

The following components appear on one or more of the following state hazardous substances lists:

#### Massachusetts Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Aminoethylpiperazine  
Diethylenetriamine  
Diphenylolpropane

#### New Jersey Right to Know

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Aminoethylpiperazine  
Diethylenetriamine  
Diphenylolpropane

#### Pennsylvania Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Aminoethylpiperazine  
Diethylenetriamine

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Diphenylolpropane

## Other Regulations

### A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

### B: Component Analysis – Inventory Component Analysis - Inventory

CAS #	Component	TSCA	DSL	EINECS
9046-10-0	Polyoxypropylenediamine	Yes	Yes	Yes
111-40-0	Diethylenetriamine	Yes	Yes	Yes
140-31-8	Aminoethylpiperazine	Yes	Yes	Yes
68479-04-9	1,3-Propanediamine, N-[3-(tridecyloxy)propyl]-, branched	Yes	Yes	Yes
84852-15-3	Phenol, 4-nonyl-, branched	Yes	Yes	Yes
80-05-7	Diphenylolpropane	Yes	Yes	Yes

### C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Polyoxypropylenediamine	2855-13-2	1% / D2B, E
Diethylenetriamine	111-40-0	0.1% / D2B, E
Aminoethylpiperazine	140-31-8	1% / D2B, E
Diphenylolpropane	80-15-2	Not listed

## \*\*\* Section 16 - Other Information \*\*\*

### Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NFPA = National Fire Protection Association; HMIS = Hazardous Material Identification System; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Ergon Armor bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.