

1. IDENTIFICATION

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|----------------------------|--|
| Product Identifier: | X-E-4 |
| Alternate Names: | Diethylene glycol dinitrate in triethylene glycol DEGDN in TEG |
| Intended Use: | Propellant Ingredient |
| Manufacturer: | Copperhead Chemical Company® Inc. 120 River Road Tamaqua, PA 18252 USA |
| Emergency Contacts: | CHEMTREC (USA) (800) 424-9300 CHEMTREC (INTERNATIONAL) +1 703-741-5970 Copperhead Chemical Company® Inc. (888) 742-4506 |

2. HAZARD(S) IDENTIFICATION

Classification of the substance or mixture:

| | |
|-------------------|--|
| Expl. 1.3;H203 | Explosive; fire, blast or projection hazard. |
| Acute Tox. 2;H300 | Fatal if swallowed. |
| Acute Tox. 1;H310 | Fatal in contact with skin. |
| Acute Tox. 2;H330 | Fatal if inhaled. |
| STOT RE 2;H373 | May cause damage to organs through prolonged or repeated exposure. Specific Target Organs: (Not Available) |

GHS Label Elements:



Danger

Hazard Statements:

H203 Explosive; fire, blast or projection hazard.
H300 Fatal if swallowed.
H310 Fatal in contact with skin.
H330 Fatal if inhaled.
H373 May cause damage to organs through prolonged or repeated exposure.

Prevention Statements:

P210 Keep away from heat / sparks / open flames / hot surfaces - No smoking.

P230 Keep wetted with triethylene glycol.
 P240 Ground / bond container and receiving equipment.
 P250 Do not subject to grinding/shock/impact/friction.
 P260 Do not breathe mist / vapors / spray.
 P262 Do not get in eyes, on skin, or on clothing.
 P264 Wash thoroughly after handling.
 P270 Do not eat, drink or smoke when using this product.
 P271 Use only outdoors or in a well-ventilated area.
 P280 Wear protective gloves / eye protection / face protection.
 P284 Wear respiratory protection.

Response Statements:

P301+310 IF SWALLOWED: Immediately call a POISON CENTER or doctor / physician.
 P302+350 IF ON SKIN: Gently wash with soap and water.
 P304+340 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
 P314 Get Medical advice / attention if you feel unwell.
 P320 Specific treatment is urgent (see information on this label).
 P330 Rinse mouth.
 P361 Remove / Take off immediately all contaminated clothing.
 P363 Wash contaminated clothing before reuse.
 P370+380 In case of fire: Evacuate area.
 P372 Explosion risk in case of fire.
 P373 DO NOT fight fire when fire reaches explosives.

Storage Statements:

P401 Store in accordance with applicable regulations.
 P403+233 Store in a well ventilated place. Keep container tightly closed.
 P405 Store locked up.

Disposal Statements:

P501 Dispose of contents / container in accordance with local / national regulations.

3. COMPOSITION / INFORMATION ON INGREDIENTS

| Ingredient/Chemical Designations | Weight % | GHS Classification | Notes |
|---|----------|---|-------|
| Diethylene Glycol Dinitrate (DEGDN) CAS Number: 693-21-0 | 75 | Acute Tox. 2;H330 Acute Tox. 1;H310 Acute Tox. 2;H300 STOT RE 2;H373 Aquatic Chronic 3;H412 Expl. 1.3;H203 | [1] |
| Triethylene Glycol (TEG) CAS Number: 112-27-6 | 25 | Not Classified | [1] |

| | | | |
|--|----|----------------|--|
| 3-Methyl-1,1-diphenylurea (Akardit II) CAS Number: 13114-72-2 | <1 | Not Classified | |
|--|----|----------------|--|

- [1] Substance classified with a health or environmental hazard.
[2] Substance with a workplace exposure limit.

This product contains desensitized explosives.

H203 Explosive; fire, blast or projection hazard.

H300 Fatal if swallowed.

H310 Fatal in contact with skin.

H330 Fatal if inhaled.

H373 May cause damage to organs through prolonged or repeated exposure.

H412 Harmful to aquatic life with long lasting effects.

4. FIRST AID MEASURES

Description of first aid measures:

- General** In all cases of doubt, or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.
- Inhalation** Remove victim to fresh air and keep at rest in a position comfortable for breathing. If breathing has stopped, give artificial respiration. If unconscious place in the recovery position and obtain immediate medical attention.
- Eyes** Irrigate copiously with clean water for at least 15 minutes, holding the eyelids apart and seek medical attention.
- Skin** Remove contaminated clothing. Wash skin thoroughly with soap and water.
- Ingestion** If swallowed obtain immediate medical attention. Keep at rest. Do NOT induce vomiting.

Most important symptoms and effects, both acute and delayed:

Overview:

Contact with the product by all routes of entry may cause vasodilation, headache, nausea, lightheadedness and hypotension. Extreme exposure can result in fatigue, confusion, convulsions, methemoglobinemia, cyanosis, respiratory paralysis, bradycardia, circulatory collapse or death.

Symptoms of Exposure:

- Inhalation:** Harmful or fatal if inhaled. Extreme exposure may lead to central nervous system effects (drowsiness, nausea, headaches, paralysis, loss of consciousness and death).

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| Eyes: | Contact with the eye may cause moderate to severe irritation. |
| Skin: | Harmful or fatal if in contact with skin. Skin irritant. Product may be absorbed through the skin. |
| Ingestion: | May be harmful or fatal if swallowed. May produce central nervous system effects (dizziness, loss of balance and coordination, unconsciousness coma and death) |
| Chronic Effects: | No applicable information found |

5. FIRE FIGHTING MEASURES

Extinguishing media:

DO NOT FIGHT FIRES INVOLVING EXPLOSIVES!

Special hazards arising from the substance or mixture:

PRODUCT IS AN EXPLOSIVE SUBSTANCE!

SEVERE EXPLOSION HAZARD! Explosion can be caused by fire, sparks, excessive heat, impact, shock or friction. Risk of explosion increases with large quantities or confinement by tanks, drums, or other closed containers.

DO NOT FIGHT FIRES INVOLVING EXPLOSIVES! Separation of the explosive from the desensitizer, whether by extraction, evaporation, or any other means, is **EXTREMELY HAZARDOUS**. Contacting the product with water will separate the explosive from the desensitizer and concentrate the explosive. Keep containers closed. Undiluted explosive, even in small amounts, is an extreme explosion hazard. Explosion of undiluted or concentrated explosive may be caused by fire, sparks, excessive heat, impact, friction or shock. The explosive hazards of residual product or concentrated explosive may remain after the fire is extinguished and must be addressed before beginning any investigation or clean-up activities.

Possible toxic smoke, vapors, fallout and runoff water can result from fires depending on extent of combustion and presence of other combustible materials. Contaminated buildings, areas, and equipment must be properly decontaminated before reuse.

Advice for fire-fighters:

DO NOT FIGHT FIRES INVOLVING EXPLOSIVES! Immediately evacuate the area to a safe distance. Utilize fixed extinguishing equipment and wear full protective clothing including SCBA when protecting surrounding structures. Avoid activities that may separate the nitroglycerin from the desensitizer.

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6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures:

All operations should be performed by trained personnel familiar with the hazards and necessary precautions.

Evacuate the area to a safe distance and prevent unnecessary personnel from entering the area.

Put on appropriate personal protective equipment (see section 8).

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet.

Promptly remove soiled clothing. Dispose of contaminated articles or wash them thoroughly before reuse.

Environmental precautions:

Do not allow spills to enter drains or waterways.

Methods and material for containment and cleaning up:

It is recommended that prior to any spill, a RCRA permitted Treatment, Storage and Disposal Facility be consulted for the proper containers and absorbents to be used.

Notify safety personnel and utilize personnel trained in the clean-up of products containing explosives.

Do not subject product to fire, sparks, excessive heat, impact, friction or shock.

Eliminate sources of ignition and ventilate spill area.

Stop the leak if it is possible to do so without risk.

Desensitize the spilled material with a compatible, miscible solvent.

Use non-abrasive absorbents such as wipes or pads.

Caution! The presence or addition of abrasives or grit increases the risk of explosion caused by friction.

Caution! Evaporation of the solvent will increase the concentration of the explosive and increase the risk of explosion.

Take up the liquid before the solvent evaporates.

Place the used absorbents in closed containers with bag liners to prevent evaporation of the solvent.

After the spilled material is taken up, the spill area may be treated with fresh nitroglycerin destroyer.

Caution! Nitroglycerin destroyer contains a flammable component and liberates poisonous gas.

Nitroglycerin destroyer is made by mixing three parts by volume of Solution A with one part of Solution B, where Solution A is three parts by volume of ethanol with one part acetone and Solution B is 480 grams of 60% technical grade sodium sulfide in 1500 ml of water. Solution A is a flammable liquid and Solution B will react to liberate poisonous hydrogen sulfide gas. Remove all sources of ignition and ventilate spill area. Follow precautions on the supplier's material safety data sheets for the ingredients in Solutions A and B. Apply the nitroglycerin destroyer to the contaminated area. Some bubbling will occur and the mixture will turn yellow. When the reaction appears complete, mop it up with a cloth or sponge. Repeat until no color change occurs. Small quantities of hydrogen sulfide gas are evolved during the reaction. Provide adequate ventilation or an approved respirator for hydrogen sulfide (TLV 10 ppm). The cloth or sponge should be disposed of properly. Nitroglycerin destroyer is intended to be used only to destroy thin films of nitroglycerin. The heat of reaction makes destruction of larger amounts by this method hazardous.

7. HANDLING AND STORAGE

Precautions for safe handling:

DANGER! SEVERE EXPLOSION HAZARD. Do not subject product to fire, sparks, excessive heat, impact, friction or shock. All operations should be performed by trained personnel familiar with the hazards and necessary precautions.

Handle in well ventilated area designed for processing explosives. Observe exposure limits. Avoid contact with the product and avoid breathing vapors or aerosols. Non-sparking tools and equipment are recommended. Equipment should be bonded and grounded.

Do not eat, drink, use tobacco products, apply cosmetics, or take medications in areas where this product is handled. Wash hands and face thoroughly with soap and water after handling and prior to eating, drinking, using tobacco products, applying cosmetics or taking medications. Thorough showering and changing into fresh clothes at the end of the work shift is strongly recommended. Launder work clothes daily or use disposable coveralls. Wash work clothes separately from other laundry.

See section 2 for further details. - [Prevention]:

Conditions for safe storage:

Handle containers carefully to prevent damage and spillage.

Product should be stored in closed containers in a licensed, explosives storage magazine according to local, state and federal regulations. Store separate from incompatible materials. Product may become acidic as it ages. The pH and stabilizer content should be monitored regularly and the product should be destroyed or reprocessed if there is an indication of progressive degradation.

Incompatible materials: Water, oxidizers, acids and bases

See section 2 for further details. - [Storage]:

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Exposure Limits:

Exposure limits for the mixture have not been assigned. Limits established for the ingredients are provided as a guide.

| CAS No. | Ingredient | Source | Value |
|--------------|---|----------|----------------------|
| 0000693-21-0 | Diethylene Glycol Dinitrate (DEGDN) Stabilized | OSHA | No Established Limit |
| | | ACGIH | No Established Limit |
| | | NIOSH | No Established Limit |
| | | Supplier | No Established Limit |
| 0000112-27-6 | Triethylene Glycol (TEG) | OSHA | No Established Limit |
| | | ACGIH | No Established Limit |
| | | NIOSH | No Established Limit |

| | | | |
|--------------|---|----------|----------------------|
| | | Supplier | No Established Limit |
| 0013114-72-2 | 3-Methyl-1,1-diphenylurea (Akardit II) | OSHA | No Established Limit |
| | | ACGIH | No Established Limit |
| | | NIOSH | No Established Limit |
| | | Supplier | No Established Limit |

Exposure controls:**Respiratory**

Occupation exposures from this material should be determined by individuals with experience in industrial hygiene. The selection of appropriate respiratory protective equipment should be based on results from industrial hygiene surveys and respirator manufacturer's specifications and/or recommendations.

Eyes

Wear chemical safety glasses, goggles or face shield appropriate for exposure potential. Wearing contact lenses is not recommended when working with hazardous chemicals.

Skin

Users must make the final determination of appropriate protective clothing based on the conditions of use. Use protective clothing which is appropriate for the potential exposure. Any portion of the body which may come in contact with the product should be protected by materials that are impervious to the product under the conditions of use. Remove any contaminated clothing or footwear immediately. Dispose of contaminated articles or thoroughly decontaminate them before reuse. A one piece cotton uniform, conductive foot protection and cotton undergarments with appropriate outer protection is recommended. Clothing and shoes should have no metal fasteners or other items that might subject product to hazardous impact or friction.

Engineering Controls

Provide adequate ventilation. Where practicable this should be achieved by the use of local exhaust ventilation and good general extraction. Do not allow explosives to accumulate in the exhaust system. If ventilation is not sufficient to maintain concentrations of particulates and any vapor below occupational exposure limits suitable respiratory protection must be worn. Provide emergency eyewash stations and safety showers.

Other Work Practices

Use good personal hygiene practices. Wash hands before eating, drinking, smoking or using toilet. Promptly remove soiled clothing. Discard contaminated articles or wash them thoroughly before reuse.

See section 2 for further details. - [Prevention]:

9. PHYSICAL AND CHEMICAL PROPERTIES

| | |
|---|---|
| Appearance | Clear to light yellow liquid |
| Odor | Mild |
| Odor threshold | No applicable information found |
| pH | No applicable information found |
| Melting point / freezing point | <-60°F |
| Initial boiling point and boiling range | No applicable information found |
| Flash Point | No applicable information found |
| Evaporation rate (butyl acetate = 1) | < 1 |
| Flammability (solid, gas) | No applicable information found |
| Upper/lower flammability or explosive limits | No applicable information found |
| Vapor pressure | No applicable information found |
| Vapor Density | No applicable information found |
| Specific Gravity | >1 |
| Solubility in Water | No data for mixture; TEG = complete, DEGDN = slight |
| Partition coefficient n-octanol/water (Log Kow) | No applicable information found |
| Auto-ignition temperature | No applicable information found |
| Decomposition temperature | No applicable information found |
| Viscosity (cSt) | No applicable information found |

Other information:

No other relevant information found.

10. STABILITY AND REACTIVITY

Reactivity:

Hazardous Polymerization will not occur.

Chemical stability:

Stable under normal circumstances.

Possibility of hazardous reactions:

No data available.

Conditions to avoid:

Avoid fire, sparks, excessive heat, impact, friction, shock and direct sunlight. Avoid operations that could increase the concentration of the explosive or separate the explosive from the desensitizer. Undiluted explosive, even in small amounts, is an extreme explosion hazard.

Incompatible materials:

Water, acids, bases, oxidizers

Hazardous decomposition products:

High temperatures and fires may produce such toxic substances as nitrogen oxides, carbon monoxide and carbon dioxide.

11. TOXICOLOGICAL INFORMATION

Routes of exposure:

Skin contact, eye contact, inhalation, ingestion and injection are potential routes of exposure. DEGDN can be absorbed through the skin.

Symptoms of exposure:

See Section 4 for further details. [First Aid Measures]

Acute toxicity:

No applicable information was found for the mixture. Information about the ingredients is provided as a guide.

| Ingredient | Oral LD50, mg/kg | Skin LD50, mg/kg | Inhalation Vapor LD50, mg/L/4hr | Inhalation Dust/Mist LD50, mg/L/4hr | Inhalation Gas LD50, ppm |
|---|---------------------------------|---------------------------------|---------------------------------|-------------------------------------|---------------------------------|
| Diethylene Glycol Dinitrate (DEGDN) Stabilized - (693-21-0) | 1800 - Rat | No applicable information found | No applicable information found | No applicable information found | No applicable information found |
| Triethylene Glycol (TEG) - (112-27-6) | 15000 - Rat | No applicable information found | No applicable information found | No applicable information found | No applicable information found |
| 3-Methyl-1,1-diphenylurea (Akardit II) – (13114-72-2) | No applicable information found | |

Acute Toxicity Estimate:

| Classification | Category | Hazard Description |
|-------------------------------|----------|-----------------------------|
| Acute toxicity (oral) | 2 | Fatal if swallowed. |
| Acute toxicity (dermal) | 1 | Fatal in contact with skin. |
| Acute toxicity (inhalation) | 2 | Fatal if inhaled. |
| Skin corrosion/irritation | --- | Not Applicable |
| Serious eye damage/irritation | --- | Not Applicable |

| | | |
|---------------------------|-----|--|
| Respiratory sensitization | --- | Not Applicable |
| Skin sensitization | --- | Not Applicable |
| Germ cell mutagenicity | --- | Not Applicable |
| Carcinogenicity | --- | Not Applicable |
| Reproductive toxicity | --- | Not Applicable |
| STOT-single exposure | --- | Not Applicable |
| STOT-repeated exposure | 2 | May cause damage to organs through prolonged or repeated exposure. |
| Aspiration hazard | --- | Not Applicable |

Note: When no route specific LD50 data is available for an acute toxin, the converted acute toxicity point estimate was used in the calculation of the product's ATE (Acute Toxicity Estimate).

Carcinogenic Effects:

This product does not contain any ingredients that are carcinogens or potential carcinogens listed by OSHA, NTP or IARC.

12. ECOLOGICAL INFORMATION

Toxicity

The preparation has been assessed following the conventional method of the Dangerous Preparations Directive 1999/45/EC and GHS and is not classified as dangerous for the environment, but contains substance(s) dangerous for the environment. See section 3 for details

Aquatic Ecotoxicity

No applicable information found

Persistence and degradability

No applicable information found

Bioaccumulative potential

No applicable information found

Mobility in soil

No applicable information found

Results of PBT and vPvB assessment

This product contains no PBT/vPvB chemicals.

Other adverse effects

No applicable information found

13. DISPOSAL CONSIDERATIONS

Waste treatment methods

Description of Waste Residues: Waste residues of this product are hazardous waste.

Disposal Method: Before using the product, consult a RCRA permitted disposal facility regarding arrangements for disposal. All wastes must be disposed in accordance with RCRA hazardous waste regulations. Waste, even small quantities, should never be poured down the drain. Waste residues of the product should be destroyed at a RCRA permitted disposal facility equipped for the destruction of explosives.

Container Disposal: The empty product container should be destroyed at a RCRA permitted disposal facility equipped for the destruction of explosives. Do not distribute, make available, furnish or reuse empty container except for storage and shipment of original product.

14. TRANSPORT INFORMATION

Please see the current shipping paper for the most up-to-date shipping information, including exceptions and special circumstances.

This material is regulated by the US DOT.

| | |
|-----------------------|--|
| UN Number: | UN0477 |
| Proper Shipping Name: | Substances, Explosive, N.O.S. (Contains Diethylene Glycol Dinitrate) |
| Hazardous Class: | 1.3C |

15. REGULATORY INFORMATION

| | | |
|--|---|-----|
| Regulatory Overview: | The regulatory data in Section 15 is not intended to be all-inclusive, only selected regulations are represented. | |
| Toxic Substance Control Act (TSCA): | All components of this material are either listed or exempt from listing on the TSCA Inventory. | |
| WHMIS Classification: | D1A | |
| US EPA Tier II Hazards: | Fire: | No |
| | Sudden Release of Pressure: | Yes |
| | Reactive: | Yes |
| | Immediate (Acute): | Yes |
| | Delayed (Chronic): | Yes |

| | |
|---|--|
| EPCRA 311/312 Chemicals and RQs (lbs): | To the best of our knowledge, there are no chemicals at levels which require reporting under this statute. |
| EPCRA 302 Extremely Hazardous: | To the best of our knowledge, there are no chemicals at levels which require reporting under this statute. |
| EPCRA 313 Toxic Chemicals: | To the best of our knowledge, there are no chemicals at levels which require reporting under this statute. |
| New Jersey RTK Substances (>1%): | Diethylene Glycol Dinitrate (DEGDN) |
| Pennsylvania RTK Substances (>1%): | Triethylene Glycol (TEG) |

16. OTHER INFORMATION

Date Prepared: 1/12/21

The information contained herein is believed to be accurate and represents the best information currently available to us. This document is intended only as a guide to the appropriate precautionary handling of the material by a properly trained person using this product. Individuals receiving the information must exercise their independent judgment in determining its appropriateness for a particular purpose. No warranty, either expressed or implied, of merchantability or fitness for a particular purpose, or of any nature with respect to the product, or to the information, is made herein.

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