



The Safety Company

Issue Date No data available

Revision Date 29-May-2015

Version 1

# SAFETY DATA SHEET

## 1. IDENTIFICATION

### Product identifier

**Product Name** Ventilation Smoke Tube

### Other means of identification

**Formula** CH<sub>3</sub>COOH sorbed on silica gel, NH<sub>2</sub>CH<sub>2</sub> CH<sub>2</sub>NH<sub>2</sub> sorbed on pumice

**UN/ID No.** UN1759

**Synonyms** P/N 458480, Tube, Ventilation Smoke, Pkg. Of 12

P/N 458481, Ventilation Smoke Tube Kit

SDS011

### Recommended use of the chemical and restrictions on use

**Recommended Use** Ventilation Flow Patterns

**Uses advised against** No information available.

### Details of the supplier of the safety data sheet

#### **Manufacturer Address**

Mine Safety Appliances Company

1000 Cranberry Woods Drive

Cranberry Township, PA 16066

**Phone:** (724) 776-8900

#### **Emergency telephone number**

Customer Service: (800) MSA-2222 (8:30 a.m. – 5:00 p.m., USA local time)

(800) 255-3924 (Chem-Tel, Inc.)

## 2. HAZARDS IDENTIFICATION

### Classification

#### **Emergency Overview**

Each flexible tube contains two sealed glass ampoules, one white with approximately 0.4 gms acetic acid sorbed on silica gel and one gray / black with approximately 0.3 gms ethylenediamine sorbed on pumice. When the ampoules are manually crushed, aspirated air flow causes mixing of the released vapors which react forming ethylenediamine acetate smoke. No TLV is listed for ethylenediamine acetate; however, avoid breathing the tube effluent. Tube effluent contains ethylenediamine acetate smoke and may contain residual vapors of acetic acid and ethylenediamine, either of which will cause irritation to eyes, mucous membranes and skin.

#### **OSHA Regulatory Status**

This chemical is considered hazardous by the 2012 OSHA Hazard Communication Standard (29 CFR 1910.1200).

Skin corrosion/irritation	Category 1 Sub-category B
Serious eye damage/eye irritation	Category 1
Respiratory sensitization	Category 1
Skin sensitization	Category 1


**2. HAZARDS IDENTIFICATION - Continued**

**Label elements**

**Emergency Overview**

**Danger**

**Hazard statements**  
 Causes severe skin burns and eye damage  
 May cause allergy or asthma symptoms or breathing difficulties if inhaled  
 May cause an allergic skin reaction



**Appearance** Acetic acid / silica gel ampoule - White granules, vinegar odor.  
 Ethylenediamine / pumice ampoule  
 Gray to black granules, ammonia odor.

**Physical state** Solid

**Odor** Acetic acid: vinegar odor  
 Ethylenediamine: ammonia odor  
 Smoke:

**Precautionary Statements - Prevention**

Do not breathe dust/fume/gas/mist/vapors/spray  
Wash face, hands and any exposed skin thoroughly after handling  
Wear protective gloves/protective clothing/eye protection/face protection  
In case of inadequate ventilation wear respiratory protection  
Contaminated work clothing should not be allowed out of the workplace

**Precautionary Statements - Response**

Immediately call a POISON CENTER or doctor/physician  
Specific treatment (see Section 4)

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing  
Immediately call a POISON CENTER or doctor/physician

Wash contaminated clothing before reuse  
If skin irritation or rash occurs: Get medical advice/attention

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
Immediately call a POISON CENTER or doctor/physician

IF SWALLOWED: Rinse mouth. DO NOT induce vomiting

**Precautionary Statements - Storage**

Store locked up

**Precautionary Statements - Disposal**

Dispose of contents/container to an approved waste disposal plant

**Hazards not otherwise classified (HNOC)**

**Other Information**

Unknown Acute Toxicity                      75% of the mixture consists of ingredient(s) of unknown toxicity

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

**Synonyms** P/N 458480, Tube, Ventilation Smoke, Pkg. Of 12  
P/N 458481, Ventilation Smoke Tube Kit.

**Each tube contains two (2) ampoules:**

**Ampoule 1)** Acetic Acid sorbed on Silica gel

Chemical Name	CAS No.	Weight-%
Acetic acid	64-19-7	20
Silica Gel	63231-67-4	80

**Ampoule 2)** 1,2 – Diaminoethane (Ethylene Diamine) sorbed on Pumice

Chemical Name	CAS No.	Weight-%
Ethylenediamine	107-15-3	40
Pumice	1332-09-8	60

### 4. FIRST AID MEASURES

#### First aid measures

**General advice** As smoke puff generation is under manual control of the user by actuation of a squeeze bulb, overexposure is unlikely under intended conditions of use. First aid procedures follow should overexposure occur.

**Eye contact** Remove victim from exposure. Flush eyes with water for 15 minutes holding eyes open and raising eyelids to flush under lid areas. SEE A PHYSICIAN IMMEDIATELY.

**Skin Contact** Wash skin with soap and water.

**Inhalation** Remove victim from exposure. If breathing is difficult, administer oxygen. If breathing has stopped, give artificial respiration. GET MEDICAL ATTENTION IMMEDIATELY IN BOTH CASES.

**Ingestion** If tube contents are somehow ingested and if victim is conscious, give two glasses of water to dilute chemical. GET MEDICAL ATTENTION IMMEDIATELY.

#### Most important symptoms and effects, both acute and delayed

**Symptoms** Acetic Acid: Irritation of eyes, mucous membranes, skin. Fumes may cause eye and skin irritation. Ingestion of 1 cm<sup>3</sup> glacial acid produced perforation of the esophagus.

Ethylenediamine: Irritation of eye, mucous membranes, skin.

#### Indication of any immediate medical attention and special treatment needed

**Note to physicians** Treat symptomatically.

### 5. FIRE-FIGHTING MEASURES

#### Suitable extinguishing media

Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Unsuitable extinguishing media** No information available.

## 5. FIRE-FIGHTING MEASURES - Continued

### Specific hazards arising from the chemical

Ampoules may rupture and emit toxic fumes under fire conditions.

#### Explosion data

**Sensitivity to Mechanical Impact** None.

**Sensitivity to Static Discharge** None.

### Protective equipment and precautions for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions, protective equipment and emergency procedures

**Personal precautions** If contents of a tube are released, avoid skin contact with spilled material. Leave the immediate area if smoke is generated until smoke subsides. Wear rubber gloves and splashproof goggles.

### Environmental precautions

**Environmental precautions** See Section 12 for additional ecological information.

### Methods and material for containment and cleaning up

**Methods for containment** Prevent further leakage or spillage if safe to do so.

**Methods for cleaning up** Fill a bucket 3/4 full of water. Sweep up spilled material and place sweepings in bucket. Examine the tube to be sure both ampoules within the tube are crushed. If both ampoules are crushed, place the tube with contents into the bucket so that the tube is immersed. If the tube contains an unbroken ampoule, crush it (within the tube) and immerse the tube and its contents in the bucket. If an unbroken ampoule has been released from the tube, replace it in the tube, crush it (within the tube), and immerse the tube with contents in the bucket. In all cases let the tube soak overnight. Dispose the material in the bucket in accordance with local, state, and federal regulations.

## 7. HANDLING AND STORAGE

### Precautions for safe handling

**Advice on safe handling** Wash hands after using product.

### Conditions for safe storage, including any incompatibilities

**Storage Conditions** Store in a cool, dry location protected from crushing and impact forces.

**Incompatible materials** Acids, bases, oxidizers, carbon tetrachloride, and other chlorinated organic compounds.

**8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**Control parameters**

**Exposure Guidelines**

Chemical Name	ACGIH TLV	OSHA PEL	NIOSH IDLH
Acetic acid 64-19-7	STEL: 15 ppm TWA: 10 ppm	TWA: 10 ppm TWA: 25 mg/m <sup>3</sup> (vacated) TWA: 10 ppm (vacated) TWA: 25 mg/m <sup>3</sup>	IDLH: 50 ppm TWA: 10 ppm TWA: 25 mg/m <sup>3</sup> STEL: 15 ppm STEL: 37 mg/m <sup>3</sup>
Ethylenediamine 107-15-3	TWA: 10 ppm S*	TWA: 10 ppm TWA: 25 mg/m <sup>3</sup> (vacated) TWA: 10 ppm (vacated) TWA: 25 mg/m <sup>3</sup>	IDLH: 1000 ppm TWA: 10 ppm TWA: 25 mg/m <sup>3</sup>

**Appropriate engineering controls**

**Engineering Controls** Not applicable.

**Individual protection measures, such as personal protective equipment**

**Personal Protective Equipment** Due to the limited amount of chemicals in each tube and the slow release rate, use of personal protective equipment is not indicated under anticipated conditions of use. The user is cautioned to avoid breathing the tube emissions as they may cause irritation to eyes, mucous membranes, and skin.

**Eye/face protection** No special technical protective measures are necessary.

**Skin and body protection** No special technical protective measures are necessary.

**Respiratory protection** If exposure limits are exceeded or irritation is experienced, NIOSH/MSHA approved respiratory protection should be worn. Positive-pressure supplied air respirators may be required for high airborne contaminant concentrations. Respiratory protection must be provided in accordance with current local regulations.

**General Hygiene Considerations** Handle in accordance with good industrial hygiene and safety practice.

**Work Practices** This product is for use in determination of direction and velocity of ventilation air currents. Avoid breathing emissions from tube.

**9. PHYSICAL AND CHEMICAL PROPERTIES**

**Information on basic physical and chemical properties**

<b>Physical state</b>	Solid		
<b>Appearance</b>	Acetic acid / silica gel ampoule – White granules, vinegar odor. Ethylenediamine / pumice ampoule - Gray to black granules, ammonia odor.	<b>Odor</b>	Acetic acid: vinegar odor Ethylenediamine: ammonia odor
<b>Color</b>	Silica gel: white Pumice: gray to black	<b>Odor threshold</b>	No information available

<u>Property</u>	<u>Values</u>	<u>Remarks</u>
<b>pH</b>	No information available	The following data represents the nature of the components that make up the granules.
<b>Melting point/freezing point</b>	No information available	
<b>Boiling point / boiling range</b>	Acetic acid: 118°C Ethylenediamine: 117°C	

**9. PHYSICAL AND CHEMICAL PROPERTIES – Continued**

<b>Flash point</b>	Acetic acid: 103°F Ethylenediamine: 93°F
<b>Evaporation rate</b>	No information available
<b>Flammability (solid, gas)</b>	No information available
<b>Flammability Limit in Air</b>	
<b>Upper flammability limit:</b>	No information available
<b>Lower flammability limit:</b>	No information available
<b>Vapor pressure</b>	Acetic acid: 14.8 mmHg @ 25°C Ethylenediamine: 10.0 mmHg @ 20°C
<b>Vapor density</b>	No information available
<b>Water solubility</b>	Soluble (acetic acid, ethylenediamine)
<b>Solubility in other solvents</b>	No information available
<b>Partition coefficient</b>	No information available
<b>Autoignition temperature</b>	No information available
<b>Decomposition temperature</b>	No information available
<b>Kinematic viscosity</b>	No information available
<b>Dynamic viscosity</b>	No information available
<b>Explosive properties</b>	Acetic acid: LEL 4%, UEL 19.9% Ethylenediamine: LEL 2.6%, UEL 14.4%
<b>Oxidizing properties</b>	No information available
<b><u>Other Information</u></b>	
<b>Softening point</b>	No information available
<b>Molecular weight</b>	No information available
<b>VOC Content (%)</b>	No information available
<b>Density</b>	No information available
<b>Bulk density</b>	No information available

**10. STABILITY AND REACTIVITY****Reactivity**

Components are sorbed on inert solids. Total amount of combustible/flammable material is less than 1 gm per tube. Ampoules are sealed until time of actual use.

**Chemical stability**

Stable under recommended storage conditions.

**Possibility of Hazardous Reactions**

None under normal processing.

**Conditions to avoid**

Avoid acids, bases, oxidizers, carbon tetrachloride, and other chlorinated organic compounds.

**Incompatible materials**

Acids, bases, oxidizers, carbon tetrachloride, and other chlorinated organic compounds.

**Hazardous Decomposition Products**

None known based on information supplied.

**11. TOXICOLOGICAL INFORMATION**

**Information on likely routes of exposure**

<b>Product Information</b>	<b>Primary Routes of Entry:</b> Inhalation, eyes & skin contact, skin absorption, ingestion
<b>Inhalation</b>	No data available.
<b>Eye contact</b>	No data available.
<b>Skin Contact</b>	No data available.
<b>Ingestion</b>	No data available.

Chemical Name	Oral LD50	Dermal LD50	Inhalation LC50
Acetic acid 64-19-7	= 3310 mg/kg ( Rat )	= 1060 mg/kg ( Rabbit )	= 11.4 mg/L ( Rat ) 4 h
Ethylene diamine 107-15-3	= 637 mg/kg ( Rat )	= 560 mg/kg ( Rabbit )	-

**Information on toxicological effects**

**Symptoms** Acetic Acid: Irritation of eyes, mucous membranes, skin. Fumes may cause eye and skin irritation. Ingestion of 1 cm<sup>3</sup> glacial acid produced perforation of the esophagus.  
Ethylenediamine: Irritation of eye, mucous membranes, skin.

**Delayed and immediate effects as well as chronic effects from short and long-term exposure**

<b>Sensitization</b>	No information available.
<b>Germ cell mutagenicity</b>	See RTECS data for acetic acid.
<b>Carcinogenicity</b>	This product does not contain any carcinogens or potential carcinogens as listed by OSHA, IARC or NTP.
<b>Reproductive toxicity</b>	No information available.
<b>STOT - single exposure</b>	No information available.
<b>STOT - repeated exposure</b>	No information available.
<b>Target Organ Effects</b>	Eyes, nose, throat, skin, liver, kidney.
<b>Aspiration hazard</b>	No information available.

**Numerical measures of toxicity - Product Information**

**Unknown Acute Toxicity** 75% of the mixture consists of ingredient(s) of unknown toxicity

**12. ECOLOGICAL INFORMATION**

**Ecotoxicity**

75% of the mixture consists of component(s) of unknown hazards to the aquatic environment.

Chemical Name	Algae/aquatic plants	Fish	Toxicity to microorganisms	Crustacea
Acetic acid 64-19-7	-	79: 96 h Pimephales promelas mg/L LC50 static 75: 96 h Lepomis macrochirus mg/L LC50 static	EC50 = 8.8 mg/L 15 min EC50 = 8.8 mg/L 25 min EC50 = 8.8 mg/L 5 min	65: 48 h Daphnia magna mg/L EC50 Static 47: 24 h Daphnia magna mg/L EC50
Ethylenediamine 107-15-3	645: 72 h Pseudokirchneriella subcapitata mg/L EC50 151: 96 h Pseudokirchneriella subcapitata mg/L EC50	98.6 - 131.6: 96 h Pimephales promelas mg/L LC50 static 180 - 560: 96 h Poecilia reticulata mg/L LC50 semi-static 191 - 254: 96 h Pimephales promelas mg/L LC50 flow-through 115.7: 96 h Pimephales promelas mg/L LC50 semi-static	EC50 = 20 mg/L 15 min EC50 = 29 mg/L 17 h	17: 48 h Daphnia magna mg/L EC50

**Persistence and degradability**

If released to water or soil, acetic acid will biodegrade readily. Evaporation from dry surfaces is likely to occur. When spilled on soil, the liquid will spread on the surface and penetrate into the soil at a rate dependent on the soil type and its water content. If released to the atmosphere, it is degraded in the vapor-phase by reaction with photochemically produced hydroxyl radicals (estimated typical half-life of 26.7 days). It occurs in atmospheric particulate matter and physical removal from air can occur via wet and dry deposition. Natural waters will neutralize dilute solutions to acetate salts.

On soil, ethylenediamine will leach and volatilize. In water, substance will form alkaline solution and will biodegrade. Bioconcentration is not predicted. In air, substance will react with hydroxyl radicals and carbon dioxide. Biological Oxygen Demand (BOD): 75% (theor.), 5 days.

**Bioaccumulation**

Acetic acid shows no potential for biological accumulation or food chain contamination.

Chemical Name	Partition coefficient
Acetic acid 64-19-7	-0.31
Ethylene diamine 107-15-3	-1.221

**Other adverse effects** No information available

**13. DISPOSAL CONSIDERATIONS**

**Waste treatment methods**

**Disposal of wastes** Disposal should be in accordance with applicable regional, national and local laws and regulations.

**Contaminated packaging** Do not reuse container.

Chemical Name	California Hazardous Waste Status
Acetic acid 64-19-7	Toxic Corrosive Ignitable
Ethylenediamine 107-15-3	Toxic



**14. TRANSPORT INFORMATION**

**Note:** This material can be shipped under limited quantity rules if shipping less than the applicable limited quantity maximum. When shipping limited quantity by air, IATA Packing Instruction Y845 applies. However, check with the transporter prior to shipping for transporter specific restrictions.

**DOT** Regulated

**UNID No.** UN1759  
**Proper shipping name** Corrosive solids, n.o.s. (acetic acid, ethylenediamine)  
**Hazard Class** 8  
**Packing Group** III

**IATA** May be shipped "limited quantity". When shipping by air and using the limited quantity exception. Both the corrosive label and the air limited quantity diamond are required. Packing Instruction Y845. Max quantity per package: 1 kg per inner package, 5 kg net quantity per package.



**IMDG** Not regulated

**RID** Not regulated

**15. REGULATORY INFORMATION**

**International Inventories**

**TSCA** All ingredients are on the inventory or exempt from listing  
**DSL/NDL** All ingredients are on the inventory or exempt from listing  
**EINECS/ELINCS** Not evaluated  
**ENCS** Not evaluated  
**IECSC** All ingredients are on the inventory or exempt from listing  
**KECL** All ingredients are on the inventory or exempt from listing  
**PICCS** All ingredients are on the inventory or exempt from listing  
**AICS** All ingredients are on the inventory or exempt from listing

**Legend:**

**TSCA** - United States Toxic Substances Control Act Section 8(b) Inventory  
**DSL/NDL** - Canadian Domestic Substances List/Non-Domestic Substances List  
**EINECS/ELINCS** - European Inventory of Existing Chemical Substances/European List of Notified Chemical Substances  
**ENCS** - Japan Existing and New Chemical Substances  
**IECSC** - China Inventory of Existing Chemical Substances  
**KECL** - Korean Existing and Evaluated Chemical Substances  
**PICCS** - Philippines Inventory of Chemicals and Chemical Substances  
**AICS** - Australian Inventory of Chemical Substances

**US Federal Regulations**

**SARA 313**

Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA). This product does not contain any chemicals which are subject to the reporting requirements of the Act and Title 40 of the Code of Federal Regulations, Part 372

**SARA 311/312 Hazard Categories**

<b>Acute health hazard</b>	Yes
<b>Chronic Health Hazard</b>	No
<b>Fire hazard</b>	No
<b>Sudden release of pressure hazard</b>	No
<b>Reactive Hazard</b>	No

**15. REGULATORY INFORMATION - Continued**

**CWA (Clean Water Act)**

This product contains the following substances which are regulated pollutants pursuant to the Clean Water Act (40 CFR 122.21 and 40 CFR 122.42):

Chemical Name	CWA - Reportable Quantities	CWA - Toxic Pollutants	CWA - Priority Pollutants	CWA - Hazardous Substances
Acetic acid 64-19-7	5000 lb	-	-	X
Ethylene diamine 107-15-3	5000 lb	-	-	X

**CERCLA**

This material, as supplied, contains one or more substances regulated as a hazardous substance under the Comprehensive Environmental Response Compensation and Liability Act (CERCLA) (40 CFR 302)

Chemical Name	Hazardous Substances RQs	CERCLA/SARA RQ	Reportable Quantity (RQ)
Acetic acid 64-19-7	5000 lb	-	RQ 5000 lb final RQ RQ 2270 kg final RQ
Ethylene diamine 107-15-3	5000 lb	5000 lb	RQ 5000 lb final RQ RQ 2270 kg final RQ

**US State Regulations**

**California Proposition 65**

This product does not contain any Proposition 65 chemicals

**U.S. State Right-to-Know Regulations**

Chemical Name	New Jersey	Massachusetts	Pennsylvania
Acetic acid 64-19-7	X	X	X
Ethylene diamine 107-15-3	X	X	X
Silica Gel 63231-67-4	-	X	X

**U.S. EPA Label Information**

EPA Pesticide Registration Number Not applicable

**Canada**

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

**WHMIS Hazard Class**

E - Corrosive material



**16. OTHER INFORMATION**

Revision Date 29-May-2015

Revision Note Conversion to SDS

**Disclaimer**

**WARNING: This is a hazardous chemical product. By following the directions and warnings provided with this product, the hazards associated with the use of this product can be greatly reduced but never entirely eliminated. Mine Safety Appliances Company makes no warranties, expressed or implied, with respect to this product and EXPRESSLY DISCLAIMS THE WARRANTY OF MERCHANTABILITY AND ANY WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. Users assume all risks in handling, using or storing this product.**

<b>PREPARED BY:</b> Comprehensive Safety Compliance, Inc. (CSC) Occupational Health and Safety Consultant (412) 826-5480	<b>VERSION NO.:</b> 1	<b>APPROVAL DATE:</b> 5/29/15
<b>CONTACT:</b> Mine Safety Appliances Company 1000 Cranberry Woods Drive Cranberry Township, PA 16066 (724) 776-8900	<b>SUPERSEDES MSDS DATED:</b> 8/8/2013	

**End of Safety Data Sheet**