SAFETY DATA SHEET

Version: 3.0
Date of Issue: 20-Apr-2017
Date of First Issue: 13-Aug-2014

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ACCORDING TO OSHA HCS (29 CFR 1910.1200)

SECTION 1: IDENTIFICATION

Product identifier used on the label Tetra Etch Compound TEC-1

Other means of identification

Chemical Name	Mixture
CAS No.	Mixture
EINECS No.	Mixture

Recommended use of the chemical and restrictions on use

Recommended use	Etchant and acids
Restrictions on use	For professional users only.

Details of the supplier of the safety data sheet

Supplier	VISHAY MEASUREMENTS GROUP, INC.
Address of Supplier	Post Office Box 27777 Raleigh, NC 27611 USA
Telephone	+1 919-365-3800
Fax	+1 919-365-3945
E-Mail (competent person)	mm.us@vishaypg.com

Emergency telephone number 1-800-424-9300 CHEMTREC (24 hours)

SECTION 2: HAZARD(S) IDENTIFICATION

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Physical hazards	Flammable Liquid, Category 2 Water-reactive, Category 3
Health hazards	Skin corrosion/irritation, Category 1 Acute toxicity, Category 4 (Inhalation) Carcinogen, Category 2 Reproductive toxicity, Category 1
Environmental hazards	Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 1

Hazard Symbol

Signal Word(s) DANGER

Hazard Statement(s)

Highly flammable liquid and vapour.
In contact with water releases flammable gases.
Causes severe skin burns and eye damage.
Harmful if inhaled.
Suspected of causing cancer (Inhalation).
May damage fertility. May damage the unborn child (embryotoxicity, damage of testes).
Very toxic to aquatic life with long lasting effects.

Precautionary Statement(s)

Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.

Do not allow contact with water.
Do not breathe vapour.
Wash hands and exposed skin thoroughly after handling.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.
Do not eat, drink or smoke when using this product.
Wear protective gloves/protective clothing/eye protection/face protection.
IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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/doctor.
IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician
Store locked up.
Dispose of contents in accordance with local, state or national legislation.

Other hazards None.

Percent of the mixture consists of ingredient(s) of unknown acute toxicity: 0%

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures Substances in preparations / mixtures

Chemical identity of the substance	%W/W	CAS No.	EC No.	Hazard classification
Ethylene glycol dimethyl ether	70 - 80	110-71-4	203-794-9	Flammable Liquid, Category 2 Acute toxicity, Category 4 (Inhalation) Skin corrosion/irritation, Category 2 Carcinogen, Category 2 Reproductive toxicity, Category 1
Naphthalene	25	91-20-3	202-049-5	Acute toxicity, Category 4 (Oral) Carcinogen, Category 2 Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 1
Sodium	< 5	7440-23-5	231-132-9	Water-reactive, Category 2 Skin corrosion/irritation, Category 1

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Self-protection of the first aider: Wear appropriate personal protective equipment, avoid direct contact. Keep away sources of ignition. Ensure adequate ventilation. Do not breathe vapour. Avoid all contact.

Inhalation: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Apply artificial respiration if necessary (do not employ mouth-to-mouth method). Immediately call a POISON CENTER/doctor.

Skin Contact: IF ON SKIN: Remove contaminated clothing and wash all affected areas with

	plenty of water. Contaminated clothing should be thoroughly cleaned. Immediately call a POISON CENTER/doctor.
Eye Contact	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/doctor. Treatment by an ophthalmologist due to possible caustic burn of the eyes may be required. Continue irrigation until medical attention can be obtained.
Ingestion	IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Make victim drink plenty of water. Do not give anything by mouth to an unconscious person. Immediately call a POISON CENTER or doctor/physician.
Most important symptoms and effects, both acute and delayed	Causes severe skin burns and eye damage. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture. Can be absorbed through skin. Harmful if inhaled. Suspected of causing cancer. May damage fertility. May damage the unborn child. Inhalation of solvent vapours may give rise to nausea, headaches and dizziness.
Indication of any immediate medical attention and special treatment needed	Treat symptomatically. Due to possible delayed effect of poisoning and for safety reasons, they should be kept under medical observation for at least 48 hours.
Notes to a physician:	IF IN EYES: Obtain prompt consultation, preferably from an ophthalmologist. IF INHALED: Initiate inhalative cortisone therapy (e.g. Auxiloson, Thomae).

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media	
Suitable Extinguishing Media	Dry powder (Nitrogen propellant)
Unsuitable extinguishing Media	Do not use water. In contact with water releases flammable gases.
Special hazards arising from the substance or mixture	Highly flammable liquid and vapour. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. May decompose in a fire giving off toxic fumes. Oxides of carbon, Acrid smoke, Naphthalene, Vinyl methyl ether, Methanol, Sodium methoxide, Hydrogen and polycyclic compounds. May form explosive peroxides. Containers may explode when involved in a fire.
Special protective equipment and precautions for fire fighters	Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Ensure adequate ventilation. Stop leak if safe to do so. Eliminate all ignition sources if safe to do so. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact. Use personal protective equipment as required. See Section: 8. Avoid breathing vapours.
Methods and material for containment and cleaning up	Use non-sparking equipment when picking up flammable spill. Adsorb spillages onto sand, earth or any suitable adsorbent material. Do not use water. Transfer to a container for disposal. Suitable containers: Polyethylene or Steel (drums), with a polyethylene liner. Dispose of this material and its container as hazardous waste.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Handle and open container with care. Take precautionary measures against static discharge. Do not use sparking tools. Ensure adequate ventilation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Avoid all contact. Do not breathe

	vapour. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Protect from moisture.
Conditions for safe storage, including any incompatibilities	Ground/bond container and receiving equipment. Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Keep container tightly closed. Handle and open container with care. Store contents under: Nitrogen.
Storage temperature	Keep at temperature not exceeding (°C): 0.
Incompatible materials	Strong oxidising agents and Acids. Keep from any possible contact with water. Keep away from moisture.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Naphthalene	91-20-3	10	50	15*	75*	NIOSH
		10	50	-	-	OSHA
		10	-	15	-	ACGIH, Sk A3

Note: OSHA PELs 1910.1000 TABLE Z-1 / NIOSH RELs / ACGIH TLVs
* 15 minute average value
Sk - Can be absorbed through skin.
A3: Confirmed Animal Carcinogen with Unknown Relevance to Humans: The agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histological type(s), or by mechanism(s) that may not be relevant to worker exposure. Available epidemiological studies do not confirm an increased risk of cancer in exposed humans. Available evidence does not suggest that the agent is likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.

The other components listed in Section 3 do not have occupational exposure limits.

Biological Exposure Indices

SUBSTANCE	CAS No.	Determinant	Biological Exposure Indices	Sampling Time	Note
Naphthalene	91-20-3	1-Naphthol* + 2-Naphthol*	-	End of shift	Nq, Ns

Source: 2015 ACGIH Biological Exposure Indicies (BEIs)

Nq – Nonquantitative (Biological monitoring should be considered for this substance, however, a specific BEI could not be determined due to insufficient data)
Ns – Nonspecific

The other components listed in Section 3 do not have biological exposure indicies.

Appropriate engineering controls	Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Local exhaust recommended. Guarantee that the eye flushing systems and safety showers are located close to the working place.
Individual protection measures, such as personal protective equipment (PPE)	General hygiene measures for the handling of chemicals are applicable. Avoid all contact. Do not breathe vapour. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be thoroughly cleaned. Do not eat, drink or smoke at the work place.
Eye/face protection	Wear protective eye glasses for protection against liquid splashes. Wear eye protection with side protection.

Skin protection

Hand protection: Wear impervious gloves. Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Recommended: Butyl rubber.

Body protection: Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection

In case of inadequate ventilation wear respiratory protection. Open system(s): Wear suitable respiratory protective equipment. Recommended: Full-face mask.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Green - Black Coloured liquid.
Odor	Naphthalene Odour
Odor Threshold	< 1 ppm
pH	> 12.5 (aqueous)
Melting Point/Freezing Point	Not known.
Initial boiling point and boiling range	85 °C
Flash Point	0.5 °C [Closed cup]
Evaporation rate (Butyl acetate = 1)	5 (BuAc = 1) (Ethylene Glycol Dimethyl Ether)
Flammability (solid, gas)	Not applicable - Liquid.
Upper/lower flammability or explosive limits	Flammable Limits (Upper) (%v/v): 1.8 (Air). Flammable Limits (Lower) (%v/v): 10.4 (Air)
Vapour pressure	48 mm Hg (Mixture)
Vapour density	3.11 (Air = 1) (Ethylene Glycol Dimethyl Ether)
Relative density	Not available.
Solubility(ies)	Partially soluble (Water)
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	192 °C
Decomposition Temperature	Not available.
Viscosity	Not available.

Other information Volatile Organic Compound Content: 73%

SECTION 10: STABILITY AND REACTIVITY

Reactivity Stable under normal conditions.

Chemical stability Stable under normal conditions.

Possibility of hazardous reactions Highly flammable liquid and vapour. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. May react violently with water. In contact with water releases flammable gases.

Conditions to avoid Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

Incompatible materials Strong oxidising agents and Acids. Keep from any possible contact with water. Keep away from moisture.

Hazardous decomposition product(s) May decompose in a fire giving off toxic fumes. Oxides of carbon, Acrid smoke, Naphthalene, Vinyl methyl ether, Methanol, Sodium methoxide, Hydrogen and polycyclic compounds.
Reacts with - Water. Forms sodium hydroxide, naphthalene, polycyclic compounds and hydrogen.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity - Ingestion	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Naphthalene	LD50 533 mg/kg body weight
Acute toxicity - Inhalation	Acute toxicity, Category 4 (Inhalation): Harmful if inhaled. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 14.7 mg/l.
Ethylene Glycol Dimethyl Ether	Converted acute toxicity point estimate: 11
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Skin corrosion/irritation	Skin corrosion/irritation, Category 1: Causes serious eye damage.
Serious eye damage/irritation	Skin corrosion/irritation, Category 1: Causes severe skin burns.
Respiratory or skin sensitization	Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met.
Carcinogenicity	Carcinogen, Category 2: Suspected of causing cancer (Inhalation).
Reproductive toxicity	Reproductive toxicity, Category 1: May damage fertility. May damage the unborn child (embryotoxicity, damage of testes).
STOT - single exposure	Based upon the available data, the classification criteria are not met.
STOT - repeated exposure	Based upon the available data, the classification criteria are not met.
Aspiration hazard	Based upon the available data, the classification criteria are not met.

Information on likely routes of exposure

Inhalation	Unlikely – accidental exposure
Ingestion	Unlikely – accidental exposure
Skin Contact	Possible – accidental exposure
Eye Contact	Unlikely – accidental exposure

Early onset symptoms related to exposure

Causes severe skin burns and eye damage. Due to irritant properties, swallowing may result in burns/ulceration of mouth, stomach and lower gastrointestinal tract with subsequent stricture.

Delayed health effects from exposure

Can be absorbed through skin. Suspected of causing cancer. May damage fertility. May damage the unborn child. May affect embryotoxicity and damage testes. Inhalation of solvent vapours may give rise to nausea, headaches and dizziness.

Other information

NTP Report on Carcinogens	Naphthalene: Reasonably anticipated to be a human carcinogen.
IARC Monographs	Naphthalene: Possibly carcinogenic to humans
OSHA Designated Carcinogen	Not Listed

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity	Hazardous to the aquatic environment, Acute, Category 1: Very toxic to aquatic life. Estimated Mixture LC50 (for fish) ≤ 1 mg/l (96 hr) Hazardous to the aquatic environment, Chronic, Category 1: Very toxic to aquatic life with long lasting effects. Estimated Mixture LC50 (for fish) ≤ 1 mg/l (96 hr)
Persistence and degradability	No data for the mixture as a whole. Part of the components are poorly

	biodegradable.
Bioaccumulative potential	No data for the mixture as a whole.
Mobility in soil	The product is predicted to have moderate mobility in soil.
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Do not release undiluted and unneutralised to the sewer. Dispose of this material and its container as hazardous waste. Containers must be decontaminated in accordance with all applicable regulations.

SECTION 14: TRANSPORT INFORMATION

	ADR/RID	IMDG	IATA
UN number	UN 2924	UN 2924	UN 2924
UN proper shipping name	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Sodium / Ethylene Glycol Dimethyl Ether).	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Sodium / Ethylene Glycol Dimethyl Ether).	FLAMMABLE LIQUID, CORROSIVE, N.O.S. (Sodium / Ethylene Glycol Dimethyl Ether).
Transport hazard class(es)	3 + 8	3 + 8	3 + 8
Packing group	II	II	II
Environmental hazards	Environmentally hazardous substance	Classified as a Marine Pollutant	Environmentally hazardous substance
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.		
Special precautions for user	See Section: 2		

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

US Federal Regulations

TSCA (Toxic Substance Control Act)	Ethylene Glycol Dimethyl Ether: Subject to 2,500 lb reporting threshold Naphthalen: Subject to 2,500 lb reporting threshold Sodium: Subject to 2,500 lb reporting threshold
EPCRA/SARA Section 302 Extremely Hazardous Substances	All chemicals are not listed
EPCRA Section 313 Toxics Release Inventory (TRI) Program	Naphthalene: De Minimis limit: 0.1%
NIOSH Occupational Carcinogen List	All chemicals are not listed
OSHA List of highly hazardous chemicals, toxics and reactives	All chemicals are not listed
NTP Report on Carcinogens (RoC) List	Naphthalene: Reasonably anticipated to be a human carcinogen
Poison Prevention Packaging Act	All chemicals are not listed

US State Regulations

California State, Proposition 65 List	Naphthalene: Safe harbor level - NSRL: 5.8 ug/day
California State, Safer Consumer Products Regulations	Ethylene Glycol Dimethyl Ether: Candidate Chemicals List, Group Member List: Glycol ethers Naphthalene: Initial Candidate Chemicals List Sodium: Candidate Chemicals List
Maine State, Toxic Chemicals in Children's Products Act	Naphthalene: COC list
New Jersey State Worker and Community RTK Act	Ethylene Glycol Dimethyl Ether: RTKHSL. SHHSL Naphthalene: RTKHSL. SHHSL Sodium: RTKHSL. SHHSL
Pennsylvania State, Worker and Community RTK Act	Naphthalene: Hazardous Substance List. Environmental Hazard List Sodium: Hazardous Substance List. Environmental Hazard List
Rhode Island State, Hazardous Substances RTK Act	Naphthalene: Listed; Hazardous Substance List Sodium: Hazardous Substance List

Non-Regional

IARC Monographs, List of Classifications	Naphthalene: Possibly carcinogenic to humans

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. New SDS Regulation compliant with HazCom 2012 format, all sections have been updated to include new information. Please review SDS with care.

Version	3.0
Revision Date	20-Apr-2017
Date of First Issue	13-Aug-2014

References:
Existing Safety Data Sheet (SDS). EU Data: Existing ECHA registration(s) for and Harmonised Classification(s) for Ethylene Glycol Dimethyl Ether (CAS# 110-71-4), Naphthalene (CAS# 91-20-3) and Sodium (CAS# 7440-23-5).

GHS Classification of the substance or mixture	Classification Procedure
Flammable Liquid, Category 2	Flash Point [Closed cup] Test Result/ Boiling Point (°C)
Water-reactive, Category 3	Estimated Physico-chemical properties of substance
Skin corrosion/irritation, Category 1	Physico-chemical properties of substance
Acute toxicity, Category 4 (Inhalation)	Acute Toxicity Estimate Mixture Calculation
Carcinogen, Category 2	Threshold Calculation
Reproductive toxicity, Category 1	Threshold Calculation
Hazardous to the aquatic environment, Acute, Category 1	Summation Calculation
Hazardous to the aquatic environment, Chronic, Category 1	Summation Calculation

LEGEND

ACGIH: American Conference of Governmental Industrial Hygienists
BEI: Biological Exposure Indices (ACGIH)
IARC: International Agency for Research on Cancer
Irr: Irritation
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OSHA: The Occupational Safety & Health Administration
PBT: Persistent, Bioaccumulative and Toxic
PEL: Permissible exposure limit
REL: Recommended exposure limit
SCL: Specific Concentration Limit
Skin": Risk of overexposure via dermal contact
STEL: Short Term Exposure Limit
TLV: Threshold Limit value
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
URT: Upper respiratory tract
vPvB: very Persistent and very Bioaccumulative

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

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