

### 1. PRODUCT AND COMPANY IDENTIFICATION

#### Product identifiers

**Product name:** ACCU DYNE TEST™ Marker Pens

**Recommended use of product:** Surface energy (wettability) measurement of non-absorptive solids

#### Supplier:

Diversified Enterprises  
101 Mulberry St., Ste 2N  
Claremont, NH 03743 USA  
603-543-0038

Emergency telephone number: Chemtrec 1-800-424-9300

### 2. HAZARDS IDENTIFICATION

#### Classification:

2-ethoxyethanol and Methyl Violet 2B are considered hazardous by the 2012 OSHA Standard (29 CFR 1910.1200).

Acute toxicity - oral: 2-ethoxyethanol, Category 4; Methyl Violet 2B, Category 4

Acute toxicity - ingestion: 2-ethoxyethanol, Category 4

Acute toxicity - inhalation: 2-ethoxyethanol, Category 4

Serious eye damage/irritation: 2-ethoxyethanol, Category 2B; Methyl Violet 2B, Category 2A

Reproductive toxicity: 2-ethoxyethanol, Category 1B; formamide, Category 1B

Specific organ toxicity, repeated exposure: 2-ethoxyethanol, Category 2; formamide, Category 2

Flammable liquids: 2-ethoxyethanol, Category 3

#### Label elements:

**Pictograms:** Health Hazard, Exclamation Mark, Flammable

**Signal word:** Danger

#### Hazard statements:

H222: Flammable liquid and vapor

H302: Harmful if swallowed

H313: Causes eye irritation

H332: Harmful if inhaled

H351 Suspected of causing cancer

H360 May damage fertility of the unborn child

H373 May cause damage to organs through prolonged or repeated exposure if swallowed

#### Precautionary statements - Prevention:

P201: Obtain special instructions before use

P202: Do not handle until all safety precautions have been read and understood

P210: Keep away from heat, sparks, or open flames

P233: Keep container tightly closed

P264: Wash hands and face thoroughly after handling

P270: Do not eat, drink or smoke when using this product

P271: Use only in a well-ventilated area

P280: Wear long-sleeved clothing and gloves

**Precautionary statements - Response:**

If in eyes: Rise with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If irritation persists get medical attention.

If on skin: Remove all contaminated clothing immediately. Rinse skin with water. If skin irritation occurs, get medical attention.

If swallowed: Call a poison center or physician if you feel unwell.

**Precautionary statements - Disposal:**

P501: Dispose of contents/container to an approved waste disposal plant

**3. COMPOSITION/INFORMATION ON INGREDIENTS**

Constituent	CAS No.	Concentration
2-ethoxyethanol, Reagent Grade (C)*	110-80-5	See below
Formamide, ACS Reagent Grade (F)**	75-12-7	See below
Water, Reagent Grade (H)	7732-18-5	See below
Methyl Violet 2B	8004-87-3	3.0 grams/liter (0.3% w/v)

\* 2-ethoxyethanol is also known as ethylene glycol monoethyl ether, cellosolve solvent, ethyl cellosolve, and glycol ether EE

\*\* Formamide is also known as methanamide.

**Volumetric Mix Percentages by Dyne Level**

Level	C	F	Level	C	F	Level	F	H
30	100.0%	0.0%	44	22.0%	78.0%	57	100.0%	0.0%
31	97.5%	2.5%	45	19.7%	80.3%	58	81.2%	18.8%
32	89.5%	10.5%	46	17.2%	82.8%	59	73.1%	26.9%
33	81.0%	19.0%	47	15.0%	85.0%	60	65.0%	35.0%
34	73.5%	26.5%	48	13.0%	87.0%	61	56.0%	44.0%
35	65.0%	35.0%	49	11.1%	88.9%	62	47.0%	53.0%
36	57.5%	42.5%	50	9.3%	90.7%	63	38.8%	61.2%
37	51.5%	48.5%	51	7.8%	92.2%	64	30.6%	69.4%
38	46.0%	54.0%	52	6.3%	93.7%	65	24.4%	75.6%
39	41.0%	59.0%	53	4.9%	95.1%	66	18.2%	81.8%
40	36.5%	63.5%	54	3.5%	96.5%	67	13.4%	86.6%
41	32.5%	67.5%	55	2.2%	97.8%	68	8.6%	91.4%
42	28.5%	71.5%	56	1.0%	99.0%	69	6.1%	93.9%
43	25.3%	74.7%				70	3.6%	96.4%
						72	0.0%	100.0%

**4. FIRST AID MEASURES**

**General Advice:** Poison information centers in each State capital city can provide additional assistance for scheduled poisons (13 1126).

**Skin contact:** Remove contaminated clothing. Wash exposed area with soap and water. Rinse thoroughly. If irritation persists or if contact has been prolonged, seek medical attention. Launder clothing before re-use.

**Eye contact:** Gently rinse eyes for 15 minutes. Consult a physician. Move individual into fresh air.

**Inhalation:** Move individual into fresh air. If breathing is difficult, oxygen may be given by qualified personnel. Seek immediate medical attention.

**Ingestion:** Do not induce vomiting without medical advice. Consult a physician.

**Most important symptoms and effects, both acute and delayed:** Irritating to eyes. May cause slight skin irritation. Central nervous system effects. Ingestion may cause gastrointestinal irritation, nausea, vomiting, and diarrhea. May affect the liver. May affect the kidneys. May affect the blood. May affect the bone marrow. May affect respiration. May affect fertility or cause teratogenic effects.

**Indication of any immediate medical attention and special treatment needed:** No data available.

## 5. FIRE FIGHTING MEASURES

**Suitable extinguishing media:** Carbon dioxide, alcohol-resistant foam, dry chemical, or water spray.

**Unsuitable extinguishing media:** No data available.

**Special hazards arising from the substance:** 2-ethoxyethanol is flammable. It may be ignited by heat, sparks, or flames. Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas.

**Advice for firefighters:** Wear self-contained breathing apparatus for firefighting if necessary.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions:** Use personal protective equipment. Ensure adequate ventilation. Avoid breathing vapors.

**Environmental precautions:** Prevent further leakage or spillage if safe to do so. Do not let product enter drains.

**Methods and materials for cleaning up:** Soak up with inert absorptive material and put into a suitable chemical waste disposal container.

## 7. HANDLING AND STORAGE

**Precautions for safe handling:** Avoid contact with skin and eyes. Avoid inhalation of vapor.

**Conditions for safe storage:** Keep bottles securely closed in a dry, well-ventilated place when not in use. Avoid strong oxidizing agents.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

**Components with workplace control parameters:**

### 2-ethoxyethanol:

OSHA Table Z-1 - 200 ppm TWA

ACGIH TLV - 5 ppm TWA

### Formamide:

OSHA Table Z-1 - 20 ppm TWA

ACGIH TLV - 10 ppm TWA

**Appropriate engineering controls:** Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice.

### Personal protective equipment:

Eye protection: Safety glasses.

Skin protection: Long-sleeved clothing. Gloves.

Hygiene measures: Avoid contact with skin, eyes, and clothing. Wash hands before breaks and immediately after handling product. Do not eat, drink, or smoke while using these test fluids.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance and form: Blue-violet liquid

Odor: Mild, slightly sweet to ammoniacal

Odor threshold: No data available.

pH: No data available.

Evaporation rate: No data available.

Other properties:

Property	2-ethoxyethanol	Formamide	Water	Methyl Violet 2B
Freezing/melting point	-90C	2C	0C	137C
Boiling point	135C	210C	100C	no data
Flash point, closed cup	43C	150C	n/a	n/a
Autoignition temperature	235C	no data	n/a	n/a
Flammability/explosion limits	1.8-14.0%	2.7-19.0%	n/a	n/a
Vapor pressure @ 20C	5.05 hPa	0.11 hPa	3.11 hPa	n/a
Vapor density (air = 1.0)	3.11	1.56	no data	n/a
Specific density @ 20C	0.929	1.134	0.998	n/a
Solubility in water	miscible	miscible	n/a	miscible
Partition coefficient	-0.32	no data	n/a	n/a
Decomposition temperature	no data	>180C	n/a	no data
Molecular weight	90.12	45.04	18.01	393.96

## 10. STABILITY AND REACTIVITY

**Reactivity:** Reacts with strong oxidizing agents.

**Chemical stability:** Stable under recommended storage conditions.

**Possibility of hazardous reactions:** No data available.

**Conditions to avoid:** Excessive heat, ignition sources, incompatible materials.

**Incompatible materials:** Strong oxidizing agents, strong bases, hydrogen peroxide, iodine, pyridine, sulfur oxides.

**Hazardous decomposition products:** No data available.

## 11. TOXICOLOGICAL INFORMATION

The most likely route of entry is by dermal absorption. Routes of entry include eye and skin contact, ingestion, and inhalation. Specific health effects are broken out by the two primary ingredients.

### 2-ethoxyethanol:

LD50 oral rat = 1746 mg/kg (EU Commission dataset)

LD50 oral mouse = 2451 mg/kg (RTECS)

LD50 dermal rabbit = 3300 mg/kg (LOLI, EU Commission dataset and RTECS)

LC50 inhalation rat = 4267 ppm 4 h; 15 mg/l 4 h

LC50 inhalation mouse = 1820 ppm 7 h

Carcinogenic effects: Not considered carcinogenic. Not listed by ACGIH, IARC, NTP, or OSHA HCS.

Mutagenic effects: May affect genetic material based on animal test data.

Reproductive effects: May cause adverse reproductive effects. May impair fertility.

Teratogenic effects: May cause birth defects.

Specific target organ toxicity, single exposure: No information available.

Specific target organ toxicity, repeated exposure: May cause damage to central nervous system, blood, kidneys, liver, bone marrow.

Aspiration hazard: No data available.

### Formamide:

LD50 oral rat = 5,325 mg/kg (OECD Test Guideline 401)

LC50 inhalation rat = 21 mg/l 4 h (OECD Test Guideline 403)

LD50 dermal rat = >3,000 mg/kg

Carcinogenic effects: Not identified as probable, possible, or confirmed human carcinogen by IARC, ACGIH, NTP, or OSHA.

Mutagenic effects: Mouse, male and female by micronucleus test - negative.

Reproductive effects: Presumed human reproductive toxicant.

Teratogenic effects: May cause birth defects.

Specific target organ toxicity, single exposure: No information available.

Specific target organ toxicity, repeated exposure: Oral - may cause damage to blood or organs through prolonged or repeated exposure.

Aspiration hazard: No data available.

## 12. ECOLOGICAL INFORMATION

### 2-ethoxyethanol:

Freshwater algae: 1,000 mg/l EC50 *Desmodesmus subspicatus* 72 h.

Freshwater fish: 10,000 mg/l LC50 *Lepomis macrochirus* 96 h static 1.

Water flea: 10,000 mg/l EC50 *Daphnia magna* 48 h.

Persistence and degradability: No data available.

Bioaccumulative potential: Potential for bioconcentration in aquatic organisms is low.

Mobility: Expected to have high mobility in soil.

### Formamide:

Freshwater algae: >500 mg/l EC50 *Desmodesmus subspicatus* 72 h.

Freshwater fish: 6,569 mg/l LC50 *Leuciscus idus* 96 h.

Water flea: >500 mg/l EC50 *Daphnia magna* 72 h.

Persistence and degradability: Aerobic - exposure time 28 d: 99% readily biodegradable (OECD Test Guideline 301A).

Bioaccumulative potential: No data available.

Mobility: No data available.

### 13. DISPOSAL CONSIDERATIONS

Waste must be disposed of in accordance with federal, state, and local environmental control regulations.

Spent material samples must be handled with care. Disposal of these contaminated materials also presents exposure hazards, and should not be handled without gloves or in areas with poor ventilation.

### 14. TRANSPORT INFORMATION

#### DOT

UN No.: UN 1171  
Proper shipping name: Ethylene glycol monoethyl ether  
Hazard class: 3  
Packing group: III  
ERG No.: 127  
Symbol: R4

#### ADR, RID, ICAO, TDG (Canada)

UN No.: UN 1171  
Proper shipping name: Ethylene glycol monoethyl ether  
Hazard class: 3  
Packing group: III

#### IMO/IMDG

UN No.: UN 1171  
Proper shipping name: Ethylene glycol monoethyl ether  
Hazard class: 3  
Packing group: III  
EMS: F-E

#### IATA

UN No.: UN 1171  
Proper shipping name: Ethylene glycol monoethyl ether  
Hazard class: 3  
Packing group: III  
ERG Code: 3L

### 15. REGULATORY INFORMATION

SARA Title III, Section 302 Components: None  
SARA 313 Components: 2-ethoxyethanol  
SARA 311/312 Hazards Acute health hazard, chronic health hazard, fire hazard

#### Inventories:

U.S. TSCA: 2-ethoxyethanol present, Section 5(a)2: 40 CFR 721.10001  
Canada DSL: 2-ethoxyethanol present  
Korea KECL: 2-ethoxyethanol present KE-13667  
Philippines (PICCS): 2-ethoxyethanol present  
Japan ENCS: 2-ethoxyethanol present (7)-97 (2)-411 (2)-2424  
China: 2-ethoxyethanol present  
Australia (AICS): 2-ethoxyethanol present  
EINECS No.: 2-ethoxyethanol present 203-804-1

California Directors List of Hazardous Substances: 2-ethoxyethanol present  
California Proposition 65: 2-ethoxyethanol is known to the State of California to cause birth defects or other reproductive harm.  
Massachusetts RTK: 2-ethoxyethanol, formamide present  
Minnesota: 2-ethoxyethanol present  
New Jersey RTK and (EHS) List: 2-ethoxyethanol, formamide present  
Pennsylvania RTK: 2-ethoxyethanol, formamide present  
Rhode Island RTK: 2-ethoxyethanol present

**CERCLA/SARA:** Reportable quantity, 2-ethoxyethanol = 1,000 lb.

**Canada WHMIS hazard class:** 2-ethoxyethanol - B3, D1B, D2A, D2B. Classified according to the hazard criteria of the CPR

**EU classification:** 2-ethoxyethanol - R10, R60, R61, R20/22, S53, S45, Xn. Classified in accord with Annex VI to Directive 67/548/EEC

**Indication of danger:** Xn - Harmful

## **16. OTHER INFORMATION**

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