



**Material Safety Data Sheet**  
Revision Date: 20111111

**1. PRODUCT AND COMPANY IDENTIFICATION**

**Product name:** VALIDATE<sup>®</sup> Chem 4 Calibration Verification Test Set and VALIDATE<sup>®</sup> Chem 21 Calibration Verification Test Set

**Product number:** 104ab, 201bc (bili set and enz set), and 201sd (bili set and enz set).

**VALIDATE<sup>®</sup> products are not known to be hazardous. However, the above listed VALIDATE<sup>®</sup> products contain greater than 1.0% Ethylene Glycol. Therefore, this MSDS sheets was specifically created to provide information pertaining solely to Ethylene Glycol.**

**Intended Use:** VALIDATE<sup>®</sup> Calibration Verification / Linearity Test Kit solutions are intended for *in vitro* diagnostic use in the quantitative determination of linearity, calibration verification and verification of reportable range in automated, semi-automated and manual instrument systems

**Manufacturer:** Maine Standards Company, LLC  
**Address:** 765 Roosevelt Trail  
Windham, ME 04062

**Emergency Phone:** 800-377-9684  
207-892-1300

**Fax:** 207-892-2266

**2. COMPOSITION/INFORMATION ON INGREDIENTS**

**Synonyms:** 1,2-Ethanediol; glycol; 1,2-Dihydroxyethane; Ethylene Alcohol; Ethulene Dihydrate  
**Formula:** CH<sub>2</sub>OHCH<sub>2</sub>OH  
**Molecular Weight:** 62.07  
**IUPAC Name:** Ethane-1,2-diol  
**Risk Phrases:** R 22 Harmful if swallowed.  
**Safety Phrases:** S 2 Keep out of reach of children.  
**Notes:** Ethylene Glycol is not a known carcinogen. The lethal dose for humans is ~100mL (1/3 cup).

CAS-No.	EC-No.	Index-No.	Concentration
<b>Ethylene Glycol</b>			
107-21-1	203-473-3	-	-

**3. HAZARDS IDENTIFICATION**

**Emergency Overview**

**WARNING! HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.**

Health Rating: 2 - Moderate (Life)  
Flammability Rating: 1 - Slight  
Reactivity Rating: 1 - Slight  
Contact Rating: 3 - Severe (Life)  
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES  
Storage Color Code: Green (General Storage)

**NFPA Ratings:** Health: 1 Flammability: 1 Reactivity: 0

#### Potential Health Effects

<b>Inhalation</b>	Vapor inhalation is generally not a problem unless heated or misted. Exposure to vapors over an extended time period has caused throat irritation and headache. May cause nausea, vomiting, dizziness and drowsiness. Pulmonary edema and central nervous system depression may also develop. When heated or misted, has produced rapid, involuntary eye movement and coma..
<b>Skin</b>	Minor skin irritation and penetration may occur.
<b>Eyes</b>	Splashes may cause irritation, pain, eye damage.
<b>Ingestion</b>	Initial symptoms in massive dosage parallel alcohol intoxication, progressing to CNS depression, vomiting, headache, rapid respiratory and heart rate, lowered blood pressure, stupor, collapse, and unconsciousness with convulsions. Death from respiratory arrest or cardiovascular collapse may follow. Lethal dose in humans: 100 ml (3-4 ounces).
<b>Chronic Exposure</b>	Repeated small exposures by any route can cause severe kidney problems. Brain damage may also occur. Skin allergy can develop. May damage the developing fetus.
<b>Aggravation of Pre-existing Conditions</b>	Persons with pre-existing skin disorders, eye problems, or impaired liver, kidney, or respiratory function may be more susceptible to the effects of this substance.

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#### 4. FIRST AID MEASURES

##### If inhaled

Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

##### If swallowed

Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

##### In case of skin contact

Remove any contaminated clothing. Wash skin with soap and water for at least 15 minutes. Get medical attention if irritation develops or persists.

##### In case of eye contact

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

##### Note to Physician:

Give sodium bicarbonate intravenously to treat acidosis. Urinalysis may show low specific gravity, proteinuria, pyuria, cylindruria, hematuria, calcium oxalate, and hippuric acid crystals. Ethanol can be used in antidotal treatment but monitor blood glucose when administering ethanol because it can cause hypoglycemia. Consider infusion of a diuretic such as mannitol to help prevent or control brain edema and hemodialysis to remove ethylene glycol from circulation.

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#### 5. FIRE-FIGHTING MEASURES

##### Fire

Flash point: 111C (232F) CC  
Autoignition temperature: 398C (748F)  
Flammable limits in air % by volume:  
lcl: 3.2; ucl: 15.3  
Slight to moderate fire hazard when exposed to heat or flame.

##### Explosion

Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Containers may explode when involved in a fire.

### **Fire Extinguishing Media**

Dry chemical, foam or carbon dioxide. Water or foam may cause frothing. Water spray may be used to extinguish surrounding fire and cool exposed containers. Water spray will also reduce fume and irritant gases.

### **Special Information**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full face piece operated in the pressure demand or other positive pressure mode. Toxic gases and vapors may be released if involved in a fire.

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## **6. ACCIDENTAL RELEASE MEASURES**

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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## **7. HANDLING AND STORAGE**

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from acids and oxidizing materials. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

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## **8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

### **Airborne Exposure Limits**

Ethylene Glycol [107-21-1]:

-ACGIH Short-Term Exposure Limit (STEL):  
100 mg/m<sup>3</sup> Ceiling (aerosol only)

### **Ventilation System**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

### **Personal Respirators (NIOSH Approved)**

If the exposure limit is exceeded, a half-face respirator with an organic vapor cartridge and particulate filter (NIOSH type P95 or R95 filter) may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece respirator with an organic vapor cartridge and particulate filter (NIOSH P100 or R100 filter) may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. Please note that N series filters are not recommended for this material. For emergencies or instances where the exposure levels are not known, use a full-face piece positive-pressure, air-supplied respirator. **WARNING:** Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.

### **Skin Protection**

Wear protective gloves and clean body-covering clothing.

### **Eye Protection**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

### **Environmental Fate**

On soil, substance may leach to groundwater and biodegrade rapidly. In water, substance readily biodegrades. In air, substance reacts with hydroxyl radicals (T<sub>1/2</sub>= 1 day). Substance is not expected to bioconcentrate in marine life.

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## 9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Clear oily liquid.
Odor	Odorless.
Solubility	Miscible in water.
Specific Gravity	1.1 @20C/4C
pH	No information found.
% Volatiles by volume @ 21C (70F)	100
Boiling Point	197.6C (388F)
Melting Point	-13C (9F)
Vapor Density (Air=1)	2.14
Vapor Pressure (mm Hg)	0.06 @ 20C (68F)
Evaporation Rate (BuAc=1)	No information found.

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## 10. STABILITY AND REACTIVITY

### Stability

Stable under ordinary conditions of use and storage.

### Hazardous Decomposition Products

Carbon dioxide and carbon monoxide may form when heated to decomposition. May produce acrid smoke and irritating fumes when heated to decomposition.

### Hazardous Polymerization

Will not occur.

### Incompatibilities

Strong oxidizing agents. Reacts violently with chlorosulfonic acid, oleum, sulfuric acid, perchloric acid. Causes ignition at room temperature with chromium trioxide, potassium permanganate and sodium peroxide; causes ignition at 212F(100C) with ammonium dichromate, silver chlorate, sodium chloride and uranyl nitrate.

### Conditions to Avoid

Heat, flames, ignition sources, water (absorbs readily) and incompatibles.

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## 11. TOXICOLOGICAL INFORMATION

### Toxicological Data

Oral rat LD50: 4700 mg/kg; skin rabbit LD50: 9530 mg/kg.  
Irritation - skin rabbit: 555 mg(open), mild; eye rabbit: 500mg/24H, mild.  
Investigated as a tumorigen, mutagen, reproductive effector.

### Reproductive Toxicity

Has shown teratogenic effects in laboratory animals.

Ingredient	---NTP Carcinogen---		IARC Category
	Known	Anticipated	
Ethylene Glycol (107-21-1)	No	No	None

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## 12. ECOLOGICAL INFORMATION

### Environmental Fate

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is not expected to evaporate significantly. When released into water, this material is expected to readily biodegrade. When released into the water, this material is expected to have a half-life between 1 and 10 days. This material is not expected to significantly bioaccumulate. This material has a log octanol-water partition coefficient of less than 3.0. When released into water, this material is not expected to evaporate significantly. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.

### Environmental Toxicity

The LC50/96-hour values for fish are over 100 mg/l.

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## 13. DISPOSAL CONSIDERATIONS

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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## 14. TRANSPORT INFORMATION

Not regulated.

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## 15. REGULATORY INFORMATION

-----\Chemical Inventory Status - Part 1\----- Ingredient	TSCA	EC	Japan	Australia
Ethylene Glycol (107-21-1)	Yes	Yes	Yes	Yes

-----\Chemical Inventory Status - Part 2\----- Ingredient		--Canada-- Korea	DSL	NDSL	Phil.
Ethylene Glycol (107-21-1)		Yes	Yes	No	Yes

-----\Federal, State & International Regulations - Part 1\----- Ingredient	-SARA 302- RQ	TPQ	-----SARA 313----- List	Chemical Catg.
Ethylene Glycol (107-21-1)	No	No	Yes	No

-----\Federal, State & International Regulations - Part 2\----- Ingredient	CERCLA	-RCRA- 261.33	-TSCA- 8(d)
Ethylene Glycol (107-21-1)	5000	No	No

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No  
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No  
Reactivity: No (Pure / Liquid)

**Australian Hazchem Code:** None allocated.

**Poison Schedule:** None allocated.

### WHMIS:

This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

**Label Hazard Warning**

WARNING! HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. MAY CAUSE ALLERGIC SKIN REACTION. MAY CAUSE IRRITATION TO SKIN, EYES, AND RESPIRATORY TRACT. AFFECTS CENTRAL NERVOUS SYSTEM.

**Label Precautions**

Do not breathe vapor or mist.  
Use only with adequate ventilation.  
Keep container closed.  
Avoid contact with eyes, skin and clothing.  
Wash thoroughly after handling.

**Label First Aid**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of contact, immediately flush skin or eyes with plenty of water for at least 15 minutes. Call a physician if irritation develops or persists. If swallowed, give water or milk to drink and induce vomiting. Never give anything by mouth to an unconscious person. In all cases call a physician.

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**16. OTHER INFORMATION****Further information**

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Maine Standards Company shall not be held liable for any damage resulting from handling or from contact with the above product.