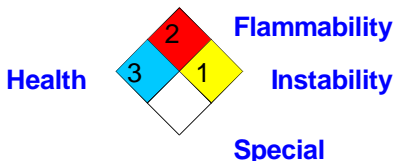


## Material Safety Data Sheet

**Emergency phone:** CHEMTREC Number  
(800) 424-9300



Health	3
Fire hazard	2
Reactivity	1
Personal protection	C

### Section 1. Chemical product and company identification

**Product name** : ENTHONE® CATALYST 20/A  
**Product code** : 135200  
**Material uses** : Specialty chemicals for the electronics and surface finishing industries.  
**Manufacturer** : Enthone Inc  
 350 Frontage Road  
 West Haven, CT 06516  
 Phone: (203) 799-4917  
 Fax: (203) 799-8179  
 www.cooksonelectronics.com

Enthone OMI deMexico S.A. de C.V.  
 Norte 59 No. 896  
 Col. Industrial Vallejo  
 Mexico, D.F. 02300  
 Mexico  
 Phone: 52 55 5078 3904  
 Fax: 52 555 567 6326  
 www.cooksonelectronics.com  
 Tel. local de emergencias: 080  
 Tel. de emergencias en  
 transportacion: 01 800 0021 400 ;  
 (55) 5559 1588

**Validation date** : 12/15/2005.      **Supersedes Date** : 11/9/2005  
**Prepared by** : R. Hescocock

### Section 2. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% by weight</u>
2,4,6-tris(dimethylaminomethyl)phenol	90-72-2	40-50
tetraethylenepentamine	112-57-2	20-30
2-butoxyethanol	111-76-2	20-30
bis[(dimethylamino)methyl]phenol	71074-89-0	1-5

Any component not listed in Section 2 is non-regulated or present in the product in concentrations below legal disclosure limits

**All ingredients comply with applicable rules or orders under United States TSCA and Canadian CEPA regulations.**

## Section 3. Hazards identification

<b>Physical state</b>	: Liquid.
<b>Odor</b>	: Amine like.
<b>Emergency overview</b>	: Danger! CAUSES RESPIRATORY TRACT, EYE AND SKIN BURNS. HARMFUL IF INHALED. MAY CAUSE ALLERGIC RESPIRATORY AND SKIN REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS: BLOOD, KIDNEYS, LIVER, MUCOUS MEMBRANES, BLADDER, RESPIRATORY TRACT, SKIN, CENTRAL NERVOUS SYSTEM, EYE, LENS OR CORNEA. POSSIBLE CANCER HAZARD CONTAINS MATERIAL WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA. COMBUSTIBLE LIQUID AND VAPOR. VAPOR MAY CAUSE FIRE.  Do not ingest. Do not get in eyes, on skin or clothing. Do not breathe vapor or mist. Keep away from heat, sparks and flame. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Risk of cancer depends on duration and level of exposure.
<b>Routes of entry</b>	: Dermal contact. Eye contact. Inhalation. Ingestion.
<b>Potential acute health effects</b>	
<b>Eye contact</b>	: Corrosive to eyes.
<b>Skin contact</b>	: Harmful in contact with skin. Corrosive to the skin. May cause sensitization by skin contact.
<b>Inhalation</b>	: Toxic by inhalation. Corrosive to the respiratory system. May cause sensitization by inhalation.
<b>Ingestion</b>	: Harmful if swallowed. May cause burns to mouth, throat and stomach.
<b>Potential chronic health effects</b>	
<b>Target organs</b>	: Contains material which may cause damage to the following organs: blood, kidneys, liver, mucous membranes, bladder, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
<b>Over-exposure signs/symptoms</b>	: <b>Tetraethylenepentamine:</b> HARMFUL IF ABSORBED THROUGH SKIN, IF SWALLOWED OR INHALED. Sensitized persons may subsequently show asthmatic symptoms when exposed to atmospheric concentrations well below the OEL Medical conditions aggravated by overexposure: pulmonary - chronic lung disease, bronchial constriction, dermatitis. Aspiration hazard if swallowed- can enter lungs and cause damage. Absorption through skin can cause symptoms similar to ingestion. Ingestion may cause nausea, weakness and central nervous system effects. Direct contact with the eyes can cause irreversible damage including blindness. <b>bis[(dimethylamino)methyl]phenol:</b> Over-exposure signs/symptoms: headache, dizziness/vertigo, nausea/vomiting. <b>2,4,6-Tris(dimethylaminomethyl)phenol:</b> Eye contact can result in corneal damage or blindness. May cause central nervous system effects.- headache, nausea/vomiting, dizziness/vertigo, mental confusion/disorientation and breathing difficulty-shortness of breath. Ingestion: May cause burns to mouth, throat and stomach. Over-exposure signs/symptoms: respiratory tract damage. <b>2-butoxyethanol:</b> Inhalation: coughing, headache, abdominal cramps/pain, nausea/vomiting, diarrhea, shortness of breath, loss of consciousness/coma. Narcotic in high concentrations. Causes damage to the following organs: kidneys, liver, heart, and bone marrow. Ingestion: Can cause gastrointestinal disturbances. Symptoms similar to those listed under inhalation. Skin: pain, swelling, Defatting to the skin. and skin lesion/eczema. 2-butoxyethanol and its acetate are readily absorbed through the skin and will cause harmful effect on the blood. Symptoms similar to those listed under

**Carcinogenicity**

- inhalation. Eyes: blinking, redness or swelling and Possible corneal damage.  
: Classified A3 (Proven for animal.) by ACGIH [2-butoxyethanol]. Classified 3 (Not classifiable for human.) by IARC [2-butoxyethanol].  
**See toxicological information (section 11)**

## Section 4. First aid measures

**First aid**

**Eye contact**

- : Provide a readily accessible eyewash facility and quick drench safety shower. Immediately flush eyes with running water for at least 30 minutes, keeping eyelids open. Get medical attention immediately.

**Skin contact**

- : Evacuate the victim to a safe area as soon as possible. Ensure that eyewash stations and safety showers are proximal to the work-station location. In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Remove contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Inhalation**

- : If inhaled, remove to fresh air. If exposed person is not breathing, give artificial respiration or oxygen applied by trained personnel. Get medical attention.

**Ingestion**

- : Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately.

**Protection of first-aiders**

- : No action shall be taken involving any personal risk or without suitable training. If fumes are still suspected to be present, the rescuer should wear an appropriate mask or a self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing, or wear gloves. Wear suitable protective clothing.

## Section 5. Fire fighting measures

**NFPA Hazard identification number Flammability**

- : 2

**Auto-ignition temperature**

- : The lowest known value is 244°C (471.2°F) (2-butoxyethanol).

**Flash point**

- : Closed cup: 68.333°C (155°F). (Setaflash)

**Flammable limits**

- : Not available.

**Products of combustion**

- : These products are carbon oxides (CO, CO<sub>2</sub>), nitrogen oxides (NO, NO<sub>2</sub>...).

**Fire hazards in presence of various substances**

- : Flammable in presence of open flames, sparks and static discharge, of heat.

**Special remarks on fire hazards**

- : In a fire, decomposition may produce toxic gases/fumes.

**Explosion hazards in presence of various substances.**

- : Not available.

**Fire fighting media and instructions**

- : In case of fire, use water spray (fog), foam, dry chemicals, or CO<sub>2</sub>.

**Special protective equipment for fire-fighters**

- Combustible liquid and vapor. Vapor may cause flash fire. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Runoff to sewer may create fire or explosion hazard.  
: Fire fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full facepiece operated in positive pressure mode.

## Section 6. Accidental release measures

- Personal precautions** : Immediately contact emergency personnel. Eliminate all ignition sources. Keep unnecessary personnel away. Use suitable protective equipment (Section 8). Do not touch or walk through spilled material.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.
- Methods for cleaning up** : Do not clean-up or dispose except under supervision of a specialist. Keep unnecessary and unprotected personnel from entering. Follow your company's spill procedures. Avoid all possible sources of ignition (spark or flame). Avoid contact with eyes, skin and clothing. Wear suitable protective clothing. Avoid breathing vapors of this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. For small spills add absorbent (soil may be used in the absence of other suitable materials) and use a non-sparking or explosion proof means to transfer material to a sealed, appropriate container for disposal. Dike large spills and use a non-sparking or explosion proof means to transfer material to an appropriate container for disposal. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of according to all federal, state and local applicable regulations.

## Section 7. Handling and storage

- Handling** : Do not ingest. Do not get in eyes, on skin or on clothing. Keep container closed. Use only with adequate ventilation. Do not breathe vapor or mist. Keep away from heat, sparks and flame. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Use explosion-proof electrical (ventilating, lighting and material handling) equipment. Wash thoroughly after handling.
- Storage** : Store in a segregated and approved area. Keep container in a cool, well-ventilated area. Keep container tightly closed and sealed until ready for use. Avoid all possible sources of ignition (spark or flame).
- Incompatibility with various substances:** : Reactive with oxidizing agents.
- Hazardous decomposition products:** : carbon oxides (CO, CO<sub>2</sub>) and nitrogen oxides (NO, NO<sub>2</sub>...)

## Section 8. Exposure Controls, Personal Protection

- Engineering controls** : Use only with adequate ventilation. If user operations generate dust, fumes, vapor or mist, use process enclosures, local exhaust ventilation, or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any explosive limits. Use explosion-proof ventilation equipment.
- Personal protection**
- Eyes** : Avoid contact with eyes. Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.  
Recommended: Face shield , Splash goggles
- Skin** : Avoid contact with skin and clothing. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.  
Body: Recommended: Chemical resistant protective suit  
Feet: Recommended: Rubber boots.

- Respiratory** : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.  
Recommended: Be sure to use an approved/certified respirator or equivalent. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Wear appropriate respirator when ventilation is inadequate.
- Hands** : Avoid contact with skin. Chemical-resistant, impervious gloves or gauntlets complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.  
<1 hour(s) (breakthrough time): Nitrile rubber , Butyl rubber
- Personal protection in case of a large spill** : Do not clean-up or dispose except under supervision of a specialist. Keep unnecessary and unprotected personnel from entering. Follow your company's spill procedures. Avoid contact with eyes, skin and clothing. Wear suitable protective clothing and eye/face protection. Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product. Avoid breathing vapors of this product. Be sure to use a MSHA/NIOSH approved respirator or equivalent. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

<u>Ingredient name</u>	<u>CAS number</u>	<u>Exposure limits</u>
Tetraethylenepentamine	112-57-2	<b>AIHA WEEL (United States, 1/2004). Skin</b> TWA: 5 mg/m <sup>3</sup> 8 hour(s). Form: All forms
2-butoxyethanol	111-76-2	<b>ACGIH TLV (United States, 1/2004). Notes: 2002 Adoption.</b> TWA: 20 ppm 8 hour(s). Form: All forms <b>NIOSH REL (United States, 6/2001). Skin</b> TWA: 24 mg/m <sup>3</sup> 10 hour(s). Form: All forms TWA: 5 ppm 10 hour(s). Form: All forms <b>OSHA PEL (United States, 6/1993). Skin</b> TWA: 240 mg/m <sup>3</sup> 8 hour(s). Form: All forms TWA: 50 ppm 8 hour(s). Form: All forms <b>OSHA PEL 1989 (United States, 3/1989). Skin</b> TWA: 120 mg/m <sup>3</sup> 8 hour(s). Form: All forms TWA: 25 ppm 8 hour(s). Form: All forms

Consult local authorities for acceptable exposure limits.

## Section 9. Physical and chemical properties

<b>Physical state</b>	: Liquid.
<b>Color</b>	: Amber.
<b>Odor</b>	: Amine like.
<b>pH</b>	: Not available.
<b>Boiling/condensation point</b>	: 171.1°C (340°F)
<b>Melting/freezing point</b>	: May start to solidify at -39.99°C (-40°F) based on data for: Tetraethylenepentamine. Weighted average: -54.99°C (-67°F)
<b>Critical temperature</b>	: The lowest known value is 367.9°C (694.2°F) (2-butoxyethanol).
<b>Specific gravity</b>	: 0.965 (Water = 1)
<b>Vapor pressure</b>	: The highest known value is <0.001 kPa (<0.01 mm Hg) (at 20°C) (2,4,6-Tris(dimethylaminomethyl)phenol). Weighted average: 0.001 kPa (0.008 mm Hg) (at 20°C)
<b>Vapor density</b>	: The highest known value is 6.52 (Air = 1) (Tetraethylenepentamine). Weighted average: 5.29 (Air = 1)

Continued on next page

<b>Odor threshold</b>	: Not available.
<b>Evaporation rate</b>	: Not available.
<b>Ionicity (in water)</b>	: Not available.
<b>Dispersion properties</b>	: See solubility in water.
<b>Solubility</b>	: Soluble in cold water, hot water.

## Section 10. Stability and reactivity

<b>Stability and reactivity</b>	The product is stable.
<b>Incompatibility with various substances:</b>	: Reactive with oxidizing agents.
<b>Other hazardous decomposition products</b>	: carbon oxides (CO, CO <sub>2</sub> ) and nitrogen oxides (NO, NO <sub>2</sub> ...)
<b>Hazardous polymerization</b>	: Will not occur.

## Section 11. Toxicological information

### Toxicity data

<u>Ingredient name</u>	<u>CAS number</u>	<u>Test</u>	<u>Result</u>	<u>Route</u>	<u>Species</u>
2,4,6-tris(dimethylaminomethyl)ph	90-72-2	LD50	1200 mg/kg	Oral	Rat
		LD50	1280 mg/kg	Dermal	Rat
		LD50	1400 mg/kg	Dermal	Rabbit
tetraethylenepentamine	112-57-2	LD50	3990 mg/kg	Oral	Rat
		LD50	470 mg/kg	Oral	Rat
2-butoxyethanol	111-76-2	LD50	300 mg/kg	Oral	Rabbit
		LD50	1200 mg/kg	Oral	Guinea pig
		LD50	220 mg/kg	Dermal	Rabbit
		LC50	450 ppm (4 hour(s))	Inhalation	Rat
		LC50	700 ppm (7 hour(s))	Inhalation	Mouse

**IDLH** : Not available.

**Chronic effects on humans** : **CARCINOGENIC EFFECTS:** Classified A3 (Proven for animal.) by ACGIH [2-butoxyethanol]. Classified 3 (Not classifiable for human.) by IARC [2-butoxyethanol].  
**MUTAGENIC EFFECTS:** Mutagenic for bacteria and/or yeast. [2-butoxyethanol].  
**DEVELOPMENTAL TOXICITY:** Classified Reproductive system/toxin/female, Reproductive system/toxin/male, Development toxin [POSSIBLE] [2-butoxyethanol].  
 Contains material which may cause damage to the following organs: blood, kidneys, liver, mucous membranes, bladder, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.

**California prop. 65** : California prop. 65: No products were found.  
 Enthone has not conducted specific studies on the toxicity of this product.

## Section 12. Ecological information

### Ecotoxicity data

#### Ingredient name

2-butoxyethanol

#### Species

Lepomis macrochirus (LC50)

#### Period

96 hour(s)

#### Result

1490 mg/l

Enthone has not conducted specific studies on the ecotoxicity or environmental fate of this product.


## Section 13. Disposal considerations

### Waste disposal

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

Consult your local or regional authorities.

## Section 14. Transport information

<u>Regulatory information</u>	<u>UN number</u>	<u>Proper shipping name</u>	<u>Class</u>	<u>Packing group</u>	<u>Label</u>	<u>Additional information</u>
<u>DOT Classification</u>	UN3267	CORROSIVE LIQUID, BASIC, ORGANIC, N.O.S. (PRIMARY ALIPHATIC AMINE)	8	III		ERG#153

## Section 15. Regulatory information

### United States

#### U.S. Federal regulations

: All ingredients comply with applicable rules or orders under United States TSCA and Canadian CEPA regulations.

TSCA 12(b) annual export notification: No products were found.

TSCA 12(b) one time export: No products were found.

TSCA 5(a)2 final significant rules: No products were found.

Clean air act (CAA) 112 accidental release prevention: No products were found.

Clean air act (CAA) 112 regulated flammable substances: No products were found.

Clean air act (CAA) 112 regulated toxic substances: No products were found.

#### Product name

: 2-butoxyethanol

#### CAS number

111-76-2

#### Concentration

20-30

#### SARA 313

#### State regulations WHMIS (Canada)

: No products were found.

: Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).

Class D-1A: Material causing immediate and serious toxic effects (VERY TOXIC).

Class D-2B: Material causing other toxic effects (TOXIC).

Class E: Corrosive liquid.

All ingredients in this product are found on the CEPA DSL.

## Section 16. Other information

### Definition of Terms

ACGIH	American Conference of Governmental Industrial Hygienists
Ceiling	Maximum exposure limit defined by OSHA
CAS	Chemical Abstract Service
IARC	International Agency for Research on Cancer
NIOSH	National Institute for Occupational Safety and Health
NTP	National Toxicology Program
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
REL	Recommended Exposure Limit
RTK	Right to Know
SARA	Superfund Amendments and Reauthorization Act
STEL	Short Term Exposure Limit
TLV	ACGIH Threshold Limit Value
TLV-C	ACGIH Threshold Limit Value, Ceiling
TRADE SECRET	Claimed as allowed under 29CFR§1910.1200
TSCA	Toxic Substances Control Act
PPE	Personal Protection Equipment
CEPA	Canadian Environmental Protection Act
DSL	Domestic Substance List
NDSL	Non-Domestic Substance List
NSN	New Substance Notification Rules

### Disclaimer

This Material Safety Data Sheet may be used to comply with OSHA's Hazard Communication Standard, 29CFR§1910.1200. This Material Safety Data Sheet may also be used to comply with the requirements of Workplace Hazardous Materials Information System, of the Controlled Products Regulations, under the Hazardous Products Act. Enthone furnishes the data contained herein in good faith without liability or legal responsibility for same whatsoever, and no warranty or guarantee, express or implied, is made with respect to such data; nor does Enthone grant permission, recommendation, or inducement to infringe any patent whether owned by Enthone or others. The data is offered solely for your information and consideration. Since conditions of use are beyond Enthone's control, user assumes all responsibility and risk.



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