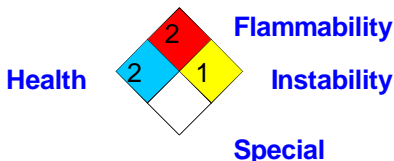


## Material Safety Data Sheet

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



Health	2
Fire hazard	2
Reactivity	1
Personal protection	C

### Section 1. Chemical product and company identification

**Product name** : ENTHONE® 50-100R  
**Product code** : 135616  
**Material uses** : Specialty chemicals for the electronics and surface finishing industries.  
**Manufacturer** : Enthone Inc  
 Enthone OMI de Mexico S.A. de C.V.  
 350 Frontage Road  
 Norte 59 No. 896  
 West Haven, CT 06516  
 Col. Industrial Vallejo  
 Mexico, D.F. 02300  
 Phone: (203) 799-4917  
 Mexico  
 Fax: (203) 799-8179  
 Phone: 52 55 5078 3904  
 www.cooksonelectronics.com  
 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** : 6/10/2005  
**Prepared by** : R. Hescock

### Section 2. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% by weight</u>
phenol, 4,4'-(1-methylethylidene)bis-, polymer with	25036-25-3	30-40
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]		
titanium dioxide	13463-67-7	20-30
di ethylene glycol monoethyl ether acetate	112-15-2	10-20
dipropylene glycol methyl ether	34590-94-8	5-10
2-methoxy-1-methylethyl acetate	108-65-6	5-10
silica, amorphous, fumed	7631-86-9	1-5
ethyl acrylate-2-ethylhexyl acrylate copolymer	26376-86-3	1-5
aluminum hydroxide	21645-51-2	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>	: Mild.
<b>Emergency overview</b>	: Warning! CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED. CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS: KIDNEYS, LIVER, MUCOUS MEMBRANES, 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. Avoid prolonged contact with eyes, skin, and clothing. Avoid breathing 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>	: Irritating to eyes.
<b>Skin contact</b>	: Harmful in contact with skin. Irritating to skin. May cause sensitization by skin contact.
<b>Inhalation</b>	: Irritating to respiratory system.
<b>Ingestion</b>	: Harmful if swallowed.
<b>Potential chronic health effects</b>	
<b>Target organs</b>	: Contains material which may cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
<b>Over-exposure signs/symptoms</b>	: <b>dipropylene glycol methyl ether</b> : May be slightly toxic by inhalation, in contact with skin or if swallowed. Can cause dizziness, lightheadedness, headache, nausea, and blurred vision. Prolonged exposure may cause narcotic effect. <b>phenol, 4,4'-(1-methylethylidene)bis-, polymer with 2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bis[oxirane]</b> : Irritating to eyes, respiratory system and skin. MAY BE HARMFUL IF INHALED, ABSORBED THROUGH SKIN OR SWALLOWED. Material is irritating to mucous membranes and upper respiratory tract. May cause allergic skin reactions with repeated exposure. <b>Di ethylene glycol monoethyl ether acetate</b> : Inhalation and Ingestion: stomach pains, nausea/vomiting, diarrhea and central nervous system depression. Harmful if absorbed through the skin. Repeated or prolonged exposure to the substance can produce kidney damage. <b>Titanium dioxide</b> : Irritating to eyes, respiratory system and skin. If this product is a liquid, exposure to this particulate is unlikely under ordinary conditions of use. These hazards are associated with airborne exposure to the particulate form of this chemical. If this product is a liquid, exposure to this particulate is unlikely under ordinary conditions of use. <b>silica, amorphous, fumed</b> : Inhalation: coughing, shortness of breath/breathing difficulty. These hazards are associated with airborne exposure to the particulate form of this chemical. If this product is a liquid, exposure to this particulate is unlikely under ordinary conditions of use.
<b>Carcinogenicity</b>	: Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Titanium dioxide]. Classified 3 (Not classifiable for human.) by IARC [silica, amorphous, fumed].

**Special remarks on chronic effects on humans**

- : **Titanium dioxide:** Carcinogen status based on inhalation of particulate form of this chemical. If this product is a liquid, exposure to this particulate is unlikely under ordinary conditions of use.
- : **silica, amorphous, fumed:** Carcinogen status based on inhalation of particulate form of this chemical. Because this product is a liquid, exposure to this particulate is unlikely under ordinary conditions of use.

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 15 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. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wear suitable protective clothing.

## Section 5. Fire fighting measures

**NFPA Hazard identification number Flammability**

- : 2

**Auto-ignition temperature**

- : The lowest known value is 680°C (1256°F) (Di ethylene glycol monoethyl ether acetate).

**Flash point**

- : Closed cup: 62.78°C (145°F).

**Flammable limits**

- : Not available.

**Products of combustion**

- : These products are carbon oxides (CO, CO<sub>2</sub>). Some metallic oxides.

**Fire hazards in presence of various substances**

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

**Special remarks on fire hazards**

- : Vapors are heavier than air and may spread along floors. Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition and flash back. Avoid all possible sources of ignition (spark or flame).

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

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

**Special remarks on explosion hazards**

- : To dissipate static electricity during transfer, ground drum and connect to receiving container with bonding strap.

**Fire fighting media and instructions**

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

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.

**Special protective equipment for fire-fighters**

- : 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. Avoid contact with eyes, skin and clothing. Keep container closed. Use only with adequate ventilation. Avoid breathing 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>), nitrogen oxides (NO, NO<sub>2</sub>...), Organic Compounds and Metallic oxides.

## 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.
- 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.
- 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.

**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.

**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>
Titanium dioxide	13463-67-7	<p><b>ACGIH TLV (United States, 5/2004). Notes: Substance identified by other sources as a suspected or confirmed human carcinogen. 1996 Adoption Substances for which the TLV is higher than the OSHA Permissible Exposure Limit (PEL) and/or the NIOSH Recommended Exposure Limit (REL). See CFR 58(124):36338-33351, June 30, 1993, for revised OSHA PEL. Refers to Appendix A -- Carcinogens.</b>                      TWA: 10 mg/m<sup>3</sup> 8 hour(s). Form: All forms  <b>OSHA PEL (United States, 6/1993).</b>                      TWA: 15 mg/m<sup>3</sup> 8 hour(s). Form: Total dust  <b>OSHA PEL 1989 (United States, 3/1989).</b>                      TWA: 10 mg/m<sup>3</sup> 8 hour(s). Form: Total dust</p>
dipropylene glycol methyl ether	34590-94-8	<p><b>ACGIH TLV (United States, 9/2004). Skin</b>                      STEL: 909 mg/m<sup>3</sup> 15 minute(s). Form: All forms                      STEL: 150 ppm 15 minute(s). Form: All forms                      TWA: 606 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      TWA: 100 ppm 8 hour(s). Form: All forms  <b>NIOSH REL (United States, 6/2001). Skin</b>                      STEL: 900 mg/m<sup>3</sup> 15 minute(s). Form: All forms                      STEL: 150 ppm 15 minute(s). Form: All forms                      TWA: 600 mg/m<sup>3</sup> 10 hour(s). Form: All forms                      TWA: 100 ppm 10 hour(s). Form: All forms  <b>OSHA PEL (United States, 6/1993). Skin</b>                      TWA: 600 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      TWA: 100 ppm 8 hour(s). Form: All forms  <b>OSHA PEL 1989 (United States, 3/1989). Skin</b>                      STEL: 900 mg/m<sup>3</sup> 15 minute(s). Form: All forms                      STEL: 150 ppm 15 minute(s). Form: All forms                      TWA: 600 mg/m<sup>3</sup> 8 hour(s). Form: All forms                      TWA: 100 ppm 8 hour(s). Form: All forms</p>
2-Methoxy-1-methylethyl acetate	108-65-6	<p><b>AIHA WEEL (United States, 1/2004).</b>                      TWA: 100 ppm 8 hour(s). Form: All forms</p>
silica, amorphous, fumed	7631-86-9	<p><b>NIOSH REL (United States, 6/2001).</b>                      TWA: 6 mg/m<sup>3</sup> 10 hour(s). Form: All forms</p>
Aluminum hydroxide	21645-51-2	<p><b>ACGIH TLV (United States, 9/2004).</b>                      TWA: 2 mg/m<sup>3</sup> 8 hour(s). Form: Soluble  <b>NIOSH REL (United States, 6/2001).</b>                      TWA: 2 mg/m<sup>3</sup> 10 hour(s). Form: All forms</p>

**Consult local authorities for acceptable exposure limits.**

## Section 9. Physical and chemical properties

<b>Physical state</b>	: Liquid.
<b>Color</b>	: White.
<b>Odor</b>	: Mild.
<b>pH</b>	: Not available.
<b>Boiling/condensation point</b>	: 173°C (343.4°F)
<b>Melting/freezing point</b>	: May start to solidify at -75°C (-103°F) based on data for: 2-Methoxy-1-methylethyl acetate. Weighted average: -79.2°C (-110.6°F)
<b>Specific gravity</b>	: 1.4 (Water = 1)
<b>Vapor pressure</b>	: The highest known value is 0.3 kPa (2.4 mm Hg) (at 20°C) (2-Methoxy-1-methylethyl acetate).
<b>Vapor density</b>	: The highest known value is 6.07 (Air = 1) (Di ethylene glycol monoethyl ether acetate). Weighted average: 5.35 (Air = 1)
<b>Odor threshold</b>	: Not available.
<b>Evaporation rate</b>	: 0.02 (dipropylene glycol methyl ether) compared to Butyl acetate.
<b>Ionicity (in water)</b>	: Not available.
<b>Dispersion properties</b>	: Is not dispersed in cold water, hot water.
<b>Solubility</b>	: Insoluble 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> ), nitrogen oxides (NO, NO <sub>2</sub> ...), Organic Compounds and Metallic oxides.
<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>
phenol,	25036-25-3	LD50	>2000 mg/kg	Oral	Rat
4,4'-(1-methylethylidene)bis-, polymer with		LD50	>2000 mg/kg	Dermal	Rabbit
2,2'-[(1-methylethylidene)bis(4,1-pf di ethylene glycol monoethyl ether acetate	112-15-2	LD50	4400 mg/kg	Oral	Rabbit
		LD50	3930 mg/kg	Oral	Guinea pig
		LD50	11000 mg/kg	Oral	Rat
dipropylene glycol methyl ether	34590-94-8	LD50	7500 mg/kg	Oral	Dog
2-methoxy-1-methylethyl acetate	108-65-6	LD50	8532 mg/kg	Oral	Rat
silica, amorphous, fumed	7631-86-9	LD50	>5000 mg/kg	Oral	Rat
		LD50	>2000 mg/kg	Dermal	Rabbit
ethyl acrylate-2-ethylhexyl acrylate copolymer	26376-86-3	LD50	>7940 mg/kg	Oral	Rat
		LD50	>7940 mg/kg	Dermal	Rabbit

**IDLH** : Not available.

Continued on next page

- Chronic effects on humans** : **CARCINOGENIC EFFECTS:** Classified A4 (Not classifiable for human or animal.) by ACGIH, 3 (Not classifiable for human.) by IARC [Titanium dioxide]. Classified 3 (Not classifiable for human.) by IARC [silica, amorphous, fumed].  
Contains material which may cause damage to the following organs: kidneys, liver, mucous membranes, upper respiratory tract, skin, central nervous system (CNS), eye, lens or cornea.
- Special remarks on chronic effects on humans** : **Titanium dioxide:** Carcinogen status based on inhalation of particulate form of this chemical. If this product is a liquid, exposure to this particulate is unlikely under ordinary conditions of use.  
**silica, amorphous, fumed:** Carcinogen status based on inhalation of particulate form of this chemical. Because this product is a liquid, exposure to this particulate is unlikely under ordinary conditions of use.
- California prop. 65** : **WARNING:** This product contains chemical(s) known to the state of California to cause cancer, birth defects or other reproductive harm: Benzene  
**WARNING:** This product contains chemical(s) known to the state of California to cause reproductive harm (male): Benzene  
California prop. 65 (no significant risk level): Benzene  
California prop. 65 (acceptable daily intake level): Benzene  
**WARNING:** This product contains chemical(s) known to the state of California to cause birth defects or other reproductive harm.: Benzene  
**WARNING:** This product contains chemical(s) known to the state of California to cause cancer.: Benzene

Enthone has not conducted specific studies on the toxicity of this product.

## Section 12. Ecological information

### Ecotoxicity data

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
titanium dioxide	Daphnia magna (EC50)	48 hour(s)	>1000 mg/l
ethyl acrylate-2-ethylhexyl acrylate copolymer	Fish (LC50)	96 hour(s)	>1000 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

Regulatory information	UN number	Proper shipping name	Class	Packing group	Label	Additional information
DOT Classification	Not regulated.	-	-	Not available.		Not available.

## 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.

	<u>Product name</u>	<u>CAS number</u>	<u>Concentration</u>
<b>SARA 313</b>	: di ethylene glycol monoethyl ether acetate	112-15-2	10-20

**State regulations** : California prop. 65 (no significant risk level): Benzene

**WHMIS (Canada)** : Class B-3: Combustible liquid with a flash point between 37.8°C (100°F) and 93.3°C (200°F).  
Class D-2B: Material causing other toxic effects (TOXIC).  
Ingredients not listed on the CEPA DSL:

limestone

Ingredients listed on the CEPA NDSL:

limestone

## 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

Continued on next page

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.



**Cookson Electronics**