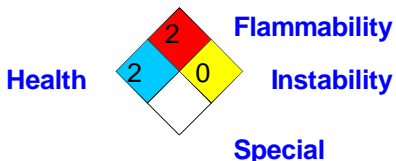


Material Safety Data Sheet

Emergency phone: CHEMTREC Number
(800) 424-9300



Health	2
Fire hazard	2
Reactivity	0
Personal protection	J

Section 1. Chemical product and company identification

Product name : ENTHONE® AD-2002
Product code : 135169
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 : 12/9/2005. **Supersedes Date** : 9/8/2003
Prepared by : R. Hescock

Section 2. Composition, Information on Ingredients

<u>Name</u>	<u>CAS number</u>	<u>% by weight</u>
1-methoxy-2-propanol	107-98-2	80-90
4-methylpentan-2-one	108-10-1	10-20

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

Physical state : Liquid.
Odor : Mild.
Emergency overview : Warning!

CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION.
CONTAINS MATERIAL WHICH CAUSES DAMAGE TO THE FOLLOWING ORGANS:
CENTRAL NERVOUS SYSTEM.
FLAMMABLE LIQUID AND VAPOR.
VAPOR MAY CAUSE FLASH FIRE.
MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED.
CONTAINS MATERIAL WHICH MAY CAUSE DAMAGE TO THE FOLLOWING
ORGANS: KIDNEYS, LIVER, RESPIRATORY TRACT, SKIN, EYES.
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.

- Routes of entry** : Dermal contact. Eye contact. Inhalation. Ingestion.
- Potential acute health effects**
- Eye contact** : Irritating to eyes.
- Skin contact** : Harmful in contact with skin. Irritating to skin.
- Inhalation** : Irritating to respiratory system.
- Ingestion** : Harmful if swallowed.
- Potential chronic health effects**
- Target organs** : Contains material which causes damage to the following organs: central nervous system (CNS).
Contains material which may cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes.
- Over-exposure signs/symptoms** : **4-Methylpentan-2-one**: Inhalation of high concentrations of vapour may affect the central nervous system. Aspiration hazard if swallowed- can enter lungs and cause damage. Repeated or prolonged contact with irritants may cause dermatitis.
1-Methoxy-2-propanol: Eyes : Mildly irritating to the eyes. Skin: Prolonged or repeated exposure may cause irritation. Harmful if absorbed through the skin. Inhalation: Material is irritating to mucous membranes and upper respiratory tract. Inhalation of high concentrations of vapour may affect the central nervous system. Ingestion: Swallowing large amounts may be harmful. Chronic effects: May cause damage to the following organs: kidneys, liver (Based on studies with laboratory animals.)
- Carcinogenicity** : Not classified or listed by IARC, NTP, OSHA, EU and ACGIH.
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 287.22°C (549°F) (1-Methoxy-2-propanol).
- Flash point** : Closed cup: 21.111°C (70°F). (Setaflash.)
- Flammable limits** : Not available.
- Products of combustion** : These products are carbon oxides (CO, CO₂).
- Fire hazards in presence of various substances** : Highly flammable in presence of open flames, sparks and static discharge, of heat.
- Explosion hazards in presence of various substances.** : Explosive in presence of open flames, sparks and static discharge, of heat.
Slightly explosive in presence of reducing materials.
- Fire fighting media and instructions** : In case of fire, use water spray (fog), foam, dry chemicals, or CO₂.
- Flammable 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.
- : :

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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: safety apron
Feet: Recommended: Nitrile rubber
- 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. Employers must ensure that employees are properly fitted and trained in the use of respiratory and other personal protection equipment. 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.
>8 hour(s) (breakthrough time): Butyl rubber, Nitrile rubber. 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>
1-Methoxy-2-propanol	107-98-2	ACGIH TLV (United States, 9/2004). STEL: 553 mg/m ³ 15 minute(s). Form: All forms STEL: 150 ppm 15 minute(s). Form: All forms TWA: 369 mg/m ³ 8 hour(s). Form: All forms TWA: 100 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). STEL: 540 mg/m ³ 15 minute(s). Form: All forms STEL: 150 ppm 15 minute(s). Form: All forms TWA: 360 mg/m ³ 10 hour(s). Form: All forms TWA: 100 ppm 10 hour(s). Form: All forms OSHA PEL 1989 (United States, 3/1989). STEL: 540 mg/m ³ 15 minute(s). Form: All forms STEL: 150 ppm 15 minute(s). Form: All forms

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4-Methylpentan-2-one	108-10-1	<p>TWA: 360 mg/m³ 8 hour(s). Form: All forms TWA: 100 ppm 8 hour(s). Form: All forms ACGIH TLV (United States, 9/2004). Notes: Identifies substances identified in the BEI documentation for Methemoglobin inducers (for which methemoglobin is the principle toxicity) and organophosphorous cholinesterase inhibitors are part of this notation. STEL: 307 mg/m³ 15 minute(s). Form: All forms STEL: 75 ppm 15 minute(s). Form: All forms TWA: 205 mg/m³ 8 hour(s). Form: All forms TWA: 50 ppm 8 hour(s). Form: All forms NIOSH REL (United States, 6/2001). STEL: 300 mg/m³ 15 minute(s). Form: All forms STEL: 75 ppm 15 minute(s). Form: All forms TWA: 205 mg/m³ 10 hour(s). Form: All forms TWA: 50 ppm 10 hour(s). Form: All forms OSHA PEL (United States, 6/1993). TWA: 410 mg/m³ 8 hour(s). Form: All forms TWA: 100 ppm 8 hour(s). Form: All forms OSHA PEL 1989 (United States, 3/1989). STEL: 300 mg/m³ 15 minute(s). Form: All forms STEL: 75 ppm 15 minute(s). Form: All forms TWA: 205 mg/m³ 8 hour(s). Form: All forms TWA: 50 ppm 8 hour(s). Form: All forms</p>
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Consult local authorities for acceptable exposure limits.

Section 9. Physical and chemical properties

Physical state	: Liquid.
Color	: Clear.
Odor	: Mild.
pH	: Not available.
Boiling/condensation point	: 114 to 117°C (237.2 to 242.6°F)
Melting/freezing point	: May start to solidify at -85°C (-121°F) based on data for: 4-Methylpentan-2-one. Weighted average: -93.02°C (-135.4°F)
Critical temperature	: The lowest known value is 280.9°C (537.6°F) (1-Methoxy-2-propanol).
Specific gravity	: 0.901 (Water = 1)
Vapor pressure	: 2.1 kPa (16 mm Hg) (at 20°C)
Vapor density	: >1 (Air = 1)
Odor threshold	: The lowest known value is 0.1 ppm (4-Methylpentan-2-one)
Evaporation rate	: The highest known value is 1.7 (4-Methylpentan-2-one) Weighted average: 0.99 compared to Butyl acetate.
Ionicity (in water)	: Not available.
Dispersion properties	: See solubility in water.
Solubility	: Easily soluble in cold water, hot water.

Section 10. Stability and reactivity

- Stability and reactivity** : The product is stable.
- Incompatibility with various substances:** : Reactive with oxidizing agents.
- Hazardous polymerization** : 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>
1-methoxy-2-propanol	107-98-2	LD50	5700 mg/kg	Oral	Rabbit
		LD50	11700 mg/kg	Oral	Mouse
		LD50	6600 mg/kg	Oral	Rat
		LD50	13000 mg/kg	Dermal	Rabbit
		LDLo	3739 mg/kg	Oral	Rat
		LC50	10000 ppm (5 hour(s))	Inhalation	Rat
4-methylpentan-2-one	108-10-1	LD50	2080 mg/kg	Oral	Rat
		LD50	1600 mg/kg	Oral	Guinea pig
		LD50	1900 mg/kg	Oral	Mouse
		LD50	>3000 mg/kg	Dermal	Rabbit

IDLH : Not available.

Chronic effects on humans : **DEVELOPMENTAL TOXICITY:** Classified Development toxin [POSSIBLE] [1-Methoxy-2-propanol].
Contains material which causes damage to the following organs: central nervous system (CNS).
Contains material which may cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes.

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

<u>Ingredient name</u>	<u>Species</u>	<u>Period</u>	<u>Result</u>
4-methylpentan-2-one	Scenedesmus subspicatus (EC50)	48 hour(s)	980 mg/l
	Scenedesmus subspicatus (EC50)	48 hour(s)	2000 mg/l
	Pimephales promelas (LC50)	96 hour(s)	505 mg/l
	Pimephales promelas (LC50)	96 hour(s)	537 mg/l
	Pimephales promelas (LC50)	96 hour(s)	540 mg/l

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


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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	UN1263	PAINT RELATED MATERIAL	3	II		128

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: 4-Methylpentan-2-one

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>
SARA 313	: 4-methylpentan-2-one	108-10-1	10-20

State regulations : No products were found.

WHMIS (Canada) : Class B-2: Flammable liquid with a flash point lower than 37.8°C (100°F).
Class D-2B: Material causing other toxic effects (TOXIC).
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

Continued on next page

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.



Cookson Electronics