

# ULTRACOLOR 9064 WATERPROOF INVISIBLE INK

Chemwatch Material Safety Data Sheet

Issue Date: 28-Dec-2006

NC317TCP

CHEMWATCH 47433

Version No:2.0

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

ULTRACOLOR 9064 WATERPROOF INVISIBLE INK

### SYNONYMS

"invisible marking ink"

### PROPER SHIPPING NAME

FLAMMABLE LIQUID, TOXIC, N.O.S.  
(contains ethyl acetate and ethylene glycol monobutyl ether)

### PRODUCT USE

Invisible ink.

### SUPPLIER

Company: Zeus Chemical Products Pty Ltd  
Address:  
3 Anderson Place  
South Windsor  
NSW, 2756  
AUS  
Telephone: +61 2 4577 4866  
Fax: +61 2 4577 6919

### HAZARD RATINGS

Flammability	3
Toxicity	3
Body Contact	2
Reactivity	0
Chronic	2

SCALE: Min/Nil=0 Low=1 Moderate=2 High=3 Extreme=4

## Section 2 - HAZARDS IDENTIFICATION

### STATEMENT OF HAZARDOUS NATURE

**HAZARDOUS SUBSTANCE. DANGEROUS GOODS.** According to the Criteria of NOHSC, and the ADG Code.

### POISONS SCHEDULE

S6

#### RISK

Highly flammable.  
Harmful by inhalation in contact with skin and if swallowed.  
Irritating to eyes and skin.  
HARMFUL - May cause lung damage if swallowed.  
Vapours may cause drowsiness and dizziness.  
Cumulative effects may result following exposure\*.  
May produce discomfort of the respiratory system\*.  
Limited evidence of a carcinogenic effect\*.  
May be harmful to the foetus/embryo\*.  
May possibly affect fertility\*.

\* (limited evidence).

#### SAFETY

Keep away from sources of ignition. No smoking.  
Do not breathe gas/ fumes/ vapour/ spray.  
Use only in well ventilated areas.  
Keep container in a well ventilated place.  
Avoid exposure - obtain special instructions before use.  
Do not empty into drains.  
To clean the floor and all objects contaminated by this material use water.  
Keep container tightly closed.  
Keep away from food drink and animal feeding stuffs.  
Take off immediately all contaminated clothing.  
In case of contact with eyes rinse with plenty of water and contact Doctor or Poisons Information Centre.  
If swallowed IMMEDIATELY contact Doctor or Poisons Information Centre (show this container or label).  
This material and its container must be disposed of as hazardous waste.

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
ethylene glycol monobutyl ether	111-76-2	30-60
ethanol	64-17-5	30-60
ethyl acetate	141-78-6	10-30
aminopolyamide		1-10
optical brightener		1-10

NOTE: Manufacturer has supplied full ingredient information to allow CHEMWATCH assessment.

## Section 4 - FIRST AID MEASURES

### SWALLOWED

For advice, contact a Poisons Information Centre or a doctor.  
· IF SWALLOWED, REFER FOR MEDICAL ATTENTION, WHERE POSSIBLE, WITHOUT DELAY.  
· For advice, contact a Poisons Information Centre or a doctor.  
Where Medical attention is not immediately available or where the patient is more than 15

minutes from a hospital or unless instructed otherwise:

- Induce vomiting with fingers down the back of the of the throat, ONLY IF CONSCIOUS.
- Lean patient forward or place on left side (head-down position if possible) to maintain open airway and prevent aspiration.

NOTE: Wear a protective glove when inducing vomiting by mechanical means.

- In the mean time, qualified first-aid personnel should treat the patient following observation and employing supportive measures as indicated by the patient's condition.
- If the services of a medical officer or medical doctor are readily available, the patient should be placed in his/her care and a copy of the MSDS should be provided. Further action will be the responsibility of the medical specialist.
- If medical attention is not available on the worksite or surroundings send the patient to a hospital together with a copy of the MSDS.

## **EYE**

If this product comes in contact with the eyes:

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.
- Continue flushing until advised to stop by the Poisons Information Centre or a doctor, or for at least 15 minutes.
- Transport to hospital or doctor without delay.
- Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.

## **SKIN**

If skin contact occurs:

- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).
- Seek medical attention in event of irritation.

## **INHALED**

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.
- Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures.
- Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary.
- Transport to hospital, or doctor.

## **NOTES TO PHYSICIAN**

Followed acute or short term repeated exposures to ethylene glycol monoalkyl ethers and their acetates:

- Hepatic metabolism produces ethylene glycol as a metabolite.
- Clinical presentation, following severe intoxication, resembles that of ethylene glycol exposures.
- Monitoring the urinary excretion of the alkoxyacetic acid metabolites may be a useful indication of exposure.

[Ellenhorn and Barceloux: Medical Toxicology].

For acute or short term repeated exposures to ethylene glycol:

- Early treatment of ingestion is important. Ensure emesis is satisfactory.
- Test and correct for metabolic acidosis and hypocalcaemia.
- Apply sustained diuresis when possible with hypertonic mannitol.
- Evaluate renal status and begin haemodialysis if indicated. [I.L.O]
- Rapid absorption is an indication that emesis or lavage is effective only in the first few hours. Cathartics and charcoal are generally not effective.
- Correct acidosis, fluid/electrolyte balance and respiratory depression in the usual manner. Systemic acidosis (below 7.2) can be treated with intravenous sodium bicarbonate solution.

- Ethanol therapy prolongs the half-life of ethylene glycol and reduces the formation of toxic metabolites.
- Pyridoxine and thiamine are cofactors for ethylene glycol metabolism and should be given (50 to 100 mg respectively) intramuscularly, four times per day for 2 days.
- Magnesium is also a cofactor and should be replenished. The status of 4-methylpyrazole, in the treatment regime, is still uncertain. For clearance of the material and its metabolites, haemodialysis is much superior to peritoneal dialysis.

[Ellenhorn and Barceloux: Medical Toxicology]

It has been suggested that there is a need for establishing a new biological exposure limit before a workshift that is clearly below 100 mmol ethoxy-acetic acids per mole creatinine in morning urine of people occupationally exposed to ethylene glycol ethers. This arises from the finding that an increase in urinary stones may be associated with such exposures.

Laitinen J., et al: Occupational & Environmental Medicine 1996; 53, 595-600.

## **Section 5 - FIRE FIGHTING MEASURES**

### **EXTINGUISHING MEDIA**

Water spray or fog.

- Alcohol stable foam.

Carbon dioxide.

Dry chemical powder.

### **FIRE FIGHTING**

- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- Fight fire from a safe distance, with adequate cover.
- If safe, switch off electrical equipment until vapour fire hazard removed.
- Use water delivered as a fine spray to control the fire and cool adjacent area.
- Avoid spraying water onto liquid pools.
- Do not approach containers suspected to be hot.
- Cool fire exposed containers with water spray from a protected location.
- If safe to do so, remove containers from path of fire.

### **FIRE/EXPLOSION HAZARD**

- Liquid and vapour are highly flammable.
  - Severe fire hazard when exposed to heat, flame and/or oxidisers.
  - Vapour forms an explosive mixture with air.
  - Severe explosion hazard, in the form of vapour, when exposed to flame or spark.
  - Vapour may travel a considerable distance to source of ignition.
  - Heating may cause expansion / decomposition with violent rupture of containers.
  - On combustion, may emit toxic fumes of carbon monoxide (CO).
- Other combustion products include: carbon dioxide (CO<sub>2</sub>) and nitrogen oxides (NO<sub>x</sub>).

### **FIRE INCOMPATIBILITY**

Avoid contamination with strong oxidising agents as ignition may result.

## Section 6 - ACCIDENTAL RELEASE MEASURES

### EMERGENCY PROCEDURES

#### MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid breathing vapours and contact with skin and eyes.
- Control personal contact by using protective equipment.
- Contain and absorb small quantities with vermiculite or other absorbent material.
- Wipe up.
- Collect residues in a flammable waste container.

#### MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.
- May be violently or explosively reactive.
- Wear breathing apparatus plus protective gloves.
- Prevent, by any means available, spillage from entering drains or water course.
- Consider evacuation (or protect in place).
- No smoking, naked lights or ignition sources.
- Increase ventilation.
- Stop leak if safe to do so.
- Water spray or fog may be used to disperse vapour.
- Contain spill with sand, earth or vermiculite.
- Use only spark-free shovels and explosion proof equipment.
- Collect recoverable product into labelled containers for recycling.
- Collect solid residues and seal in labelled drums for disposal.
- Wash area and prevent runoff into drains.
- After clean up operations, decontaminate and launder all protective clothing and equipment before storing and re-using.
- If contamination of drains or waterways occurs, advise emergency services.

#### PROTECTIVE ACTIONS FOR SPILL

From IERG (Canada/Australia)

Isolation Distance	50 metres
Downwind Protection Distance	300 metres
IERG Number	16

#### FOOTNOTES

- 1 PROTECTIVE ACTION ZONE is defined as the area in which people are at risk of harmful exposure. This zone assumes that random changes in wind direction confines the vapour plume to an area within 30 degrees on either side of the predominant wind direction, resulting in a crosswind protective action distance equal to the downwind protective action distance.
- 2 PROTECTIVE ACTIONS should be initiated to the extent possible, beginning with those closest to the spill and working away from the site in the downwind direction. Within the protective action zone a level of vapour concentration may exist resulting in nearly all unprotected persons becoming incapacitated and unable to take protective action and/or incurring serious or irreversible health effects.
- 3 INITIAL ISOLATION ZONE is determined as an area, including upwind of the incident, within which a high probability of localised wind reversal may expose nearly all persons without appropriate protection to life-threatening concentrations of the material.
- 4 SMALL SPILLS involve a leaking package of 200 litres (55 US gallons) or less, such as a drum (jerrican or box with inner containers). Larger packages leaking less than 200 litres and compressed gas leaking from a small cylinder are also considered "small spills".

LARGE SPILLS involve many small leaking packages or a leaking package of greater than 200 litres, such as a cargo tank, portable tank or a "one-tonne" compressed gas cylinder.

5 Guide 131 is taken from the US DOT emergency response guide book.

6 IERG information is derived from CANUTEC - Transport Canada.

**Personal Protective Equipment advice is contained in Section 8 of the MSDS.**

## **Section 7 - HANDLING AND STORAGE**

### **PROCEDURE FOR HANDLING**

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- Prevent concentration in hollows and sumps.
- DO NOT enter confined spaces until atmosphere has been checked.
- Avoid smoking, naked lights, heat or ignition sources.
- When handling, DO NOT eat, drink or smoke.
- Vapour may ignite on pumping or pouring due to static electricity.
- DO NOT use plastic buckets.
- Earth and secure metal containers when dispensing or pouring product.
- Use spark-free tools when handling.
- Avoid contact with incompatible materials.
- Keep containers securely sealed.
- Avoid physical damage to containers.
- Always wash hands with soap and water after handling.
- Work clothes should be laundered separately.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.
- Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.

### **SUITABLE CONTAINER**

- Packing as supplied by manufacturer.
- Plastic containers may only be used if approved for flammable liquid.
- Check that containers are clearly labelled and free from leaks.

### **STORAGE INCOMPATIBILITY**

DO NOT store in aluminium containers.

### **STORAGE REQUIREMENTS**

- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.
- DO NOT store in pits, depressions, basements or areas where vapours may be trapped.
- Keep containers securely sealed.
- Store away from incompatible materials in a cool, dry well ventilated area.
- Protect containers against physical damage and check regularly for leaks.
- Observe manufacturer's storing and handling recommendations.

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### **SAFE STORAGE WITH OTHER CLASSIFIED CHEMICALS**

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+: May be stored together

O: May be stored together with specific preventions

X: Must not be stored together

## Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

### EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m <sup>3</sup>	STEL ppm	STEL mg/m <sup>3</sup>
Australia Exposure Standards	ethylene glycol monobutyl ether (2-Butoxyethanol)	20	96.9	50	242
Australia Exposure Standards	ethanol (Ethyl alcohol)	1000	1880		
Australia Exposure Standards	ethyl acetate (Ethyl acetate)	200	720	400	1440

ENDOELTABLE

### EMERGENCY EXPOSURE LIMITS

Material	Revised IDLH Value (mg/m <sup>3</sup> )	Revised IDLH Value (ppm)
ethylene glycol monobutyl ether		700 [Unch]
ethanol		3,300 [LEL]
ethyl acetate		2,000 [LEL]

### NOTES

Values marked LEL indicate that the IDLH was based on 10% of the lower explosive limit for safety considerations even though the relevant toxicological data indicated that irreversible health effects or impairment of escape existed only at higher concentrations.

### ODOUR SAFETY FACTOR (OSF)

OSF=6 (ETHANOL)

Exposed individuals are NOT reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class C, D or E.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities

B	26-550	As "A" for 50-90% of persons being distracted
C	1-26	As "A" for less than 50% of persons being distracted
D	0.18-1	10-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As "D" for less than 10% of persons aware of being tested

#### MATERIAL DATA

None assigned. Refer to individual constituents.

#### INGREDIENT DATA

ETHYL ACETATE:

ETHYLENE GLYCOL MONOBUTYL ETHER:

Exposed individuals are reasonably expected to be warned, by smell, that the Exposure Standard is being exceeded.

Odour Safety Factor (OSF) is determined to fall into either Class A or B.

The Odour Safety Factor (OSF) is defined as:

OSF= Exposure Standard (TWA) ppm/ Odour Threshold Value (OTV) ppm

Classification into classes follows:

Class	OSF	Description
A	550	Over 90% of exposed individuals are aware by smell that the Exposure Standard (TLV-TWA for example) is being reached, even when distracted by working activities
B	26-550	As "A" for 50-90% of persons being distracted
C	1-26	As "A" for less than 50% of persons being distracted
D	0.18-1	10-50% of persons aware of being tested perceive by smell that the Exposure Standard is being reached
E	<0.18	As "D" for less than 10% of persons aware of being tested

ETHANOL:

ETHYLENE GLYCOL MONOBUTYL ETHER:

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time-weighted average unless specified otherwise.

CR = Cancer Risk/10000; UF = Uncertainty factor:

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

D = Developmental; R = Reproductive; TC = Transplacental carcinogen

Jankovic J., Drake F.: A Screening Method for Occupational Reproductive  
American Industrial Hygiene Association Journal 57: 641-649 (1996).



#### ETHYLENE GLYCOL MONOBUTYL ETHER:

Odour Threshold Value: 0.10 ppm (detection), 0.35 ppm (recognition)  
Although rats appear to be more susceptible than other animals anaemia is not uncommon amongst humans following exposure. The TLV reflects the need to maintain exposures below levels found to cause blood changes in experimental animals. It is concluded that this limit will reduce the significant risk of irritation, haematologic effects and other systemic effects observed in humans and animals exposed to higher vapour concentrations. The toxic effects typical of some other glycol ethers (pancytopenia, testis atrophy and teratogenic effects) are not found with this substance.

#### ETHANOL:

Odour Threshold Value: 49-716 ppm (detection), 101 ppm (recognition)  
Eye and respiratory tract irritation do not appear to occur at exposure levels of less than 5000 ppm and the TLV-TWA is thought to provide an adequate margin of safety against such effects.  
Experiments in man show that inhalation of 1000 ppm caused slight symptoms of poisoning and 5000 ppm caused strong stupor and morbid sleepiness. Subjects exposed to 5000 ppm to 10000 ppm experienced smarting of the eyes and nose and coughing. Symptoms disappeared within minutes. Inhalation also causes local irritating effects to the eyes and upper respiratory tract, headaches, sensation of heat intraocular tension, stupor, fatigue and a need to sleep.  
At 15000 ppm there was continuous lachrymation and coughing.

#### ETHYL ACETATE:

Odour Threshold Value: 6.4-50 ppm (detection), 13.3-75 ppm (recognition)  
The TLV-TWA provides a significant margin of safety from the standpoint of adverse health effects. Unacclimated subjects found the odour objectionably strong at 200 ppm. Mild nose, eye and throat irritation was experienced at 400 ppm. Workers exposed regularly at concentrations ranging from 375 ppm to 1500 ppm for several months showed no unusual signs or symptoms.

### PERSONAL PROTECTION

#### EYE

No special equipment for minor exposure i.e. when handling small quantities.

· OTHERWISE:

- Safety glasses with side shields.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lens or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59].

#### HANDS/FEET

No special equipment needed when handling small quantities.

OTHERWISE: Wear chemical protective gloves, eg. PVC.

#### OTHER

No special equipment needed when handling small quantities.

OTHERWISE:

- Overalls.
- Barrier cream.
- Eyewash unit.

## RESPIRATOR

Selection of the Class and Type of respirator will depend upon the level of breathing zone contaminant and the chemical nature of the contaminant. Protection Factors (defined as the ratio of contaminant outside and inside the mask) may also be important.

Breathing Zone Level ppm (volume)	Maximum Protection Factor	Half-face Respirator	Full-Face Respirator
1000	10	A-AUS	-
1000	50	-	A-AUS
5000	50	Airline *	-
5000	100	-	A-2
10000	100	-	A-3
	100+		Airline**

\* - Continuous Flow \*\* - Continuous-flow or positive pressure demand.

The local concentration of material, quantity and conditions of use determine the type of personal protective equipment required.

For further information consult site specific CHEMWATCH data (if available), or your Occupational Health and Safety Advisor.

## ENGINEERING CONTROLS

None required when handling small quantities.  
OTHERWISE: Use in a well-ventilated area.

## Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

### APPEARANCE

Clear flammable liquid with a fruity odour; mixes with water.

### PHYSICAL PROPERTIES

Liquid.  
Mixes with water.

Molecular Weight: Not applicable.  
Melting Range (°C): Not available.  
Solubility in water (g/L): Miscible  
pH (1% solution): Not applicable  
Volatile Component (%vol): >80  
Relative Vapour Density (air=1): >1  
Lower Explosive Limit (%): Not available  
Autoignition Temp (°C): Not available.

Boiling Range (°C): >78  
Specific Gravity (water=1): 0.850  
pH (as supplied): Not applicable  
Vapour Pressure (kPa): Not available  
Evaporation Rate: Not available  
Flash Point (°C): <23  
Upper Explosive Limit (%): Not available  
Decomposition Temp (°C): Not available

State: Liquid

## **Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION**

### **CONDITIONS CONTRIBUTING TO INSTABILITY**

- Presence of incompatible materials.
- Product is considered stable.
- Hazardous polymerisation will not occur.

## **Section 11 - TOXICOLOGICAL INFORMATION**

### **POTENTIAL HEALTH EFFECTS**

#### **ACUTE HEALTH EFFECTS**

##### **SWALLOWED**

The liquid is. discomforting to the gastro-intestinal tract and toxic if swallowed. Ingestion may result in nausea, abdominal irritation, pain and vomiting. Considered an unlikely route of entry in commercial/industrial environments.

##### **EYE**

The liquid is. highly discomforting to the eyes and is capable of causing a mild, temporary redness of the conjunctiva (similar to wind-burn), temporary impairment of vision and/ or other transient eye damage/ ulceration. The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

##### **SKIN**

The liquid is discomforting to the skin and may cause drying of the skin, which may lead to dermatitis. Toxic effects may result from skin absorption. Exposure limits with "skin" notation indicate that vapour and liquid may be absorbed through intact skin. Absorption by skin may readily exceed vapour inhalation exposure. Symptoms for skin absorption are the same as for inhalation. Contact with eyes and mucous membranes may also contribute to overall exposure and may also invalidate the exposure standard. Bare unprotected skin should not be exposed to this material. The material may accentuate any pre-existing skin condition. The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

##### **INHALED**

The vapour is discomforting to the upper respiratory tract. Inhalation of vapour is more likely at higher than normal temperatures. Inhalation of high concentrations of gas/vapour causes lung irritation with coughing and nausea, central nervous depression with headache and dizziness, slowing of reflexes, fatigue and inco-ordination.

## CHRONIC HEALTH EFFECTS

Principal routes of exposure are usually by skin contact/absorption and inhalation of vapour.

Prolonged or continuous skin contact with the liquid may cause defatting with drying, cracking, irritation and dermatitis following.

Chronic solvent inhalation exposures may result in nervous system impairment and liver and blood changes. [PATTYS].

## TOXICITY AND IRRITATION

Not available. Refer to individual constituents.

### ETHYLENE GLYCOL MONOBUTYL ETHER:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

#### TOXICITY

Oral (rat) LD50: 470 mg/kg

Dermal (rabbit) LD50: 220 mg/kg

Inhalation (human) TClO: 100 ppm

Inhalation (human) TClO: 195 ppm/8h \* [Union Carbide]

Inhalation (rat-male) LC50: 486 ppm \*

Inhalation (rat-female) LC50: 450 ppm \*

The material may produce severe irritation to the eye causing pronounced inflammation.

Repeated or prolonged exposure to irritants may produce conjunctivitis.

The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.

NOTE: Changes in kidney, liver, spleen and lungs are observed in animals exposed to high concentrations of this substance by all routes.

#### IRRITATION

Skin (rabbit): 500 mg, open; Mild

Eye (rabbit): 100 mg/24h-Moderate

Eye (rabbit): 100 mg SEVERE

### ETHANOL:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

#### TOXICITY

Oral (rat) LD50: 7060 mg/kg

Oral (human) LDLo: 1400 mg/kg

Oral (man) TDLo: 50 mg/kg

Oral (man) TDLo: 1.40 mg/kg

Oral (woman) TDLo: 256 mg/kg/12 wks

Inhalation (rat) LC50: 20,000 ppm/10h

Inhalation (rat) LC50: 64000 ppm/4h

#### IRRITATION

Skin (rabbit):20 mg/24hr-Moderate

Skin (rabbit):400 mg (open)-Mild

Eye (rabbit):100mg/24hr-Moderate

Eye (rabbit): 500 mg SEVERE

### ETHYL ACETATE:

unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

#### TOXICITY

Oral (rat) LD50: 5620 mg/kg

Inhalation (rat) LC50: 1600 ppm/8h

Inhalation (human) TClO: 400 ppm

Inhalation (Human) TClO: 400 ppm/4h

Oral (Mouse) LD50: 4100 mg/kg

Intraperitoneal (Mouse) LD50: 709 mg/kg

Oral (Rabbit) LD50: 4935 mg/kg

Oral (Guinea) pig: LD50 5500 mg/kg

#### IRRITATION

Eye (human): 400 ppm

## MATERIAL

ethylene glycol monobutyl ether  
ethanol

## CARCINOGEN

IARC:3

## REPROTOXIN

ILOM

## SENSITISER

## SKIN

## CARCINOGEN

IARC: International Agency for Research on Cancer (IARC) Carcinogens: ethylene glycol monobutyl ether Category: The substance is classified by IARC as Group 3: NOT classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing.

## REPROTOXIN

ILOM: ILO Agents toxic to the male reproductive system: ethanol

## Section 12 - ECOLOGICAL INFORMATION

Marine Pollutant: Not Determined

No data for Zeus 9064 Waterproof Invisible Ink.  
Refer to data for ingredients, which follows:

### ETHYLENE GLYCOL MONOBUTYL ETHER:

Fish LC50 (96hr.) (mg/l):	1490
BCF<100:	0.4
log Kow (Prager 1995):	0.83
log Kow (Sangster 1997):	0.8
Half- life Soil - High (hours):	672
Half- life Soil - Low (hours):	168
Half- life Air - High (hours):	32.8
Half- life Air - Low (hours):	3.28
Half- life Surface water - High (hours):	672
Half- life Surface water - Low (hours):	168
Half- life Ground water - High (hours):	1344
Half- life Ground water - Low (hours):	336
Aqueous biodegradation - Aerobic - High (hours):	672
Aqueous biodegradation - Aerobic - Low (hours):	168
Aqueous biodegradation - Anaerobic - High (hours):	2688
Aqueous biodegradation - Anaerobic - Low (hours):	672
Photooxidation half- life air - High (hours):	32.8
Photooxidation half- life air - Low (hours):	3.28
Fish LC50 (96hr.) (mg/l):	1250- 1650
Daphnia magna EC50 (48hr.) (mg/l):	600- 1000

DO NOT discharge into sewer or waterways.

log Kow: 0.76-0.83

Koc: 67

Half-life (hr) air: 17

Henry's atm m<sup>3</sup> /mol: 2.08E-08

BOD 5 if unstated: 0.71

COD: 2.2

Log BCF: 0.4

Fish toxicity:

(-) 24h LD50: 983-1650 mg/L

(Fathead minnow) 96h LC50: 1700 mg/L \*\*

Invertebrate toxicity:

cell mult. inhib. 91-900mg/L

(Daphnia) 48h LC50: >1000 mg/L \*\*

Bioaccumulation: not sig

Effects on algae and plankton: cell mult. inhib. 35-900mg/L

Degradation Biological: rapid

processes Abiotic: no hydrol&photol,RxnOH\* \*\* [Union Carbide]

### ETHANOL:

Fish LC50 (96hr.) (mg/l):	13480
Algae IC50 (72hr.) (mg/l):	1450
log Kow (Sangster 1997):	- 0.3
BOD5:	63%
ThOD:	2.1
Half- life Soil - High (hours):	24
Half- life Soil - Low (hours):	2.6
Half- life Air - High (hours):	122
Half- life Air - Low (hours):	12.2

Half- life Surface water - High (hours):	26
Half- life Surface water - Low (hours):	6.5
Half- life Ground water - High (hours):	52
Half- life Ground water - Low (hours):	13
Aqueous biodegradation - Aerobic - High (hours):	26
Aqueous biodegradation - Aerobic - Low (hours):	6.5
Aqueous biodegradation - Anaerobic - High (hours):	104
Aqueous biodegradation - Anaerobic - Low (hours):	26
Aqueous biodegradation - Removal secondary treatment - High (hours):	67%
Photooxidation half- life water - High (hours):	3.20E+05
Photooxidation half- life water - Low (hours):	8020
Photooxidation half- life air - High (hours):	122
Photooxidation half- life air - Low (hours):	12.2

DO NOT discharge into sewer or waterways.

log Kow: -0.31- -0.32

Half-life (hr) air: 144

Half-life (hr) H2O surface water: 144

Henry's atm m<sup>3</sup> /mol: 6.29E-06

BOD 5 if unstated: 0.93-1.67,63%

COD: 1.99-2.11,97%

ThOD: 2.1

When ethanol is released into the soil it readily and quickly biodegrades but may leach into ground water; most is lost by evaporation. When released into water the material readily evaporates and is biodegradable.

Ethanol does not bioaccumulate to an appreciable extent.

The material is readily degraded by reaction with photochemically produced hydroxy radicals; release into air will result in photodegradation and wet deposition.

#### ETHYL ACETATE:

log Pow (Verschueren 1983):	0.66/0.73
ThOD:	50.4
log Pow (Verschueren 1983):	0.66/0.73
BOD5:	15%
COD:	1.54 (83%)
ThOD:	1.82
Half- life Soil - High (hours):	168
Half- life Soil - Low (hours):	24
Half- life Air - High (hours):	353
Half- life Air - Low (hours):	35.3
Half- life Surface water - High (hours):	168
Half- life Surface water - Low (hours):	24
Half- life Ground water - High (hours):	336
Half- life Ground water - Low (hours):	48
Aqueous biodegradation - Aerobic - High (hours):	168
Aqueous biodegradation - Aerobic - Low (hours):	24
Aqueous biodegradation - Anaerobic - High (hours):	672
Aqueous biodegradation - Anaerobic - Low (hours):	96
Aqueous biodegradation - Removal secondary treatment - High (hours):	96%
Aqueous biodegradation - Removal secondary treatment - Low (hours):	99.90%
Photooxidation half- life water - High (hours):	9.60E+05
Photooxidation half- life water - Low (hours):	24090
Photooxidation half- life air - High (hours):	353
Photooxidation half- life air - Low (hours):	35.3
First order hydrolysis half- life (hours):	1.77E+04
Acid rate constant [M(H+)- HR]- 1:	3.05E- 08
Base rate constant [MOH]- HR]- 1:	2.99E- 05

DO NOT discharge into sewer or waterways.

log Kow: 0.66-0.73

Half-life (hr) air: 200

Half-life (hr) H2O surface water: 10

Henry's atm m<sup>3</sup> /mol: 1.20E-04

BOD 5 if unstated: 0.1-1.24,16-36%

COD: 1.54,83%

ThOD: 1.82

## Section 13 - DISPOSAL CONSIDERATIONS

- Consult manufacturer for recycling options and recycle where possible .
- Consult State Land Waste Management Authority for disposal.
- Incinerate residue at an approved site.
- Recycle containers if possible, or dispose of in an authorised landfill.

## Section 14 - TRANSPORTATION INFORMATION

Labels Required: FLAMMABLE LIQUID, TOXIC  
HAZCHEM: 3WE

UNDG:

Dangerous Goods Class:	3	Subrisk:	6.1
UN Number:	1992	Packing Group:	II
Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S. (contains ethyl acetate and ethylene glycol monobutyl ether)			

### Air Transport IATA:

ICAO/IATA Class:	3	ICAO/IATA Subrisk:	6.1
UN/ID Number:	1992	Packing Group:	II
Special provisions:	A3		
Shipping Name: FLAMMABLE LIQUID, TOXIC N.O.S.			

### Maritime Transport IMDG:

IMDG Class:	3	IMDG Subrisk:	6.1
UN Number:	1992	Packing Group:	II
EMS Number:	F-E, S-D	Special provisions:	274 944
Limited Quantities:	1 L	Marine Pollutant:	Not Determined
Shipping Name: FLAMMABLE LIQUID, TOXIC, N.O.S.			

## Section 15 - REGULATORY INFORMATION

### POISONS SCHEDULE: S6

### REGULATIONS

Zeus 9064 Waterproof Invisible Ink (CAS: None):  
No regulations applicable

ethylene glycol monobutyl ether (CAS: 111-76-2) is found on the following regulatory lists;

- Australia Exposure Standards
- Australia Hazardous Substances
- Australia High Volume Industrial Chemical List (HVICL)
- Australia Inventory of Chemical Substances (AICS)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Appendix E (Part 2)
- IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
- International Agency for Research on Cancer (IARC) Carcinogens
- OECD Representative List of High Production Volume (HPV) Chemicals

ethanol (CAS: 64-17-5) is found on the following regulatory lists;

- Australia Exposure Standards
- Australia Hazardous Substances
- Australia High Volume Industrial Chemical List (HVICL)

Australia Inventory of Chemical Substances (AICS)  
 Australia National Pollutant Inventory  
 Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5  
 IMO IBC Code Chapter 18: List of products to which the Code does not apply  
 IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances  
 International Air Transport Association (IATA) Dangerous Goods Regulations  
 International Council of Chemical Associations (ICCA) - High Production Volume List  
 OECD Representative List of High Production Volume (HPV) Chemicals

ethyl acetate (CAS: 141-78-6) is found on the following regulatory lists;

Australia Exposure Standards  
 Australia Hazardous Substances  
 Australia High Volume Industrial Chemical List (HVICL)  
 Australia Inventory of Chemical Substances (AICS)  
 Australia National Pollutant Inventory  
 IMO IBC Code Chapter 17: Summary of minimum requirements  
 IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk  
 International Council of Chemical Associations (ICCA) - High Production Volume List  
 OECD Representative List of High Production Volume (HPV) Chemicals

## Section 16 - OTHER INFORMATION

### REPRODUCTIVE HEALTH GUIDELINES

Ingredient	ORG	UF	Endpoi nt TLV	CR	Adeq
ethylene glycol monobutyl ether	3.6 mg/m <sup>3</sup>	NA	100	D	NA -
ethanol	1880 mg/m <sup>3</sup>	NA	NA	NA	Yes

These exposure guidelines have been derived from a screening level of risk assessment and should not be construed as unequivocally safe limits. ORGS represent an 8-hour time-weighted average unless specified otherwise.

CR = Cancer Risk/10000; UF = Uncertainty factor:

TLV believed to be adequate to protect reproductive health:

LOD: Limit of detection

Toxic endpoints have also been identified as:

D = Developmental; R = Reproductive; TC = Transplacental carcinogen

Jankovic J., Drake F.: A Screening Method for Occupational Reproductive

American Industrial Hygiene Association Journal 57: 641-649 (1996).

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.

A list of reference resources used to assist the committee may be found at:

[www.chemwatch.net/references](http://www.chemwatch.net/references).

The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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