

# ULTRACOLOR 9059 WATER SOL. INVISIBLE INK

Chemwatch Material Safety Data Sheet

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NC317TCP

CHEMWATCH 47441

Version No:2.0

## Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

### PRODUCT NAME

ULTRACOLOR 9059 WATER SOL. INVISIBLE INK

### SYNONYMS

"invisible marking ink"

### 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	0
Toxicity	2
Body Contact	2
Reactivity	0
Chronic	0

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

## Section 2 - HAZARDS IDENTIFICATION

### STATEMENT OF HAZARDOUS NATURE

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

## POISONS SCHEDULE

None

### RISK

Harmful if swallowed.  
Inhalation may produce health damage\*.  
Cumulative effects may result following exposure\*.  
May produce discomfort of the eyes and skin\*.  
May affect fertility\*.  
May be harmful to the foetus/ embryo\*.  
Vapours potentially cause drowsiness and dizziness\*.  
\* (limited evidence).

### SAFETY

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.  
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).

## Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
ethylene glycol	107-21-1	10-30
glycerol	56-81-5	10-30
water	7732-18-5	30-60

NOTE: Manufacturer has supplied full ingredient information for 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:  
· Wash out immediately with fresh 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.

- If pain persists or recurs seek medical attention.
- 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**

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**

- There is no restriction on the type of extinguisher which may be used.

### **FIRE FIGHTING**

- Alert Fire Brigade and tell them location and nature of hazard.
- Wear breathing apparatus plus protective gloves for fire only.
- Prevent, by any means available, spillage from entering drains or water courses.
- Use fire fighting procedures suitable for surrounding area.

- 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.
- Equipment should be thoroughly decontaminated after use.

### **FIRE/EXPLOSION HAZARD**

- The material is not readily combustible under normal conditions.
  - However, it will break down under fire conditions and the organic component may burn.
  - Not considered to be a significant fire risk.
  - Heat may cause expansion or decomposition with violent rupture of containers.
  - Decomposes on heating and may produce toxic fumes of carbon monoxide (CO).
  - May emit acrid smoke.
- Other decomposition products include: carbon dioxide (CO<sub>2</sub>).

### **FIRE INCOMPATIBILITY**

Avoid contamination with strong oxidising agents as ignition may result.

**HAZCHEM: None**

## **Section 6 - ACCIDENTAL RELEASE MEASURES**

### **EMERGENCY PROCEDURES**

#### **MINOR SPILLS**

Clean up all spills immediately.  
Avoid contact with skin and eyes.  
Wear impervious gloves and safety glasses.  
Wipe up and absorb small quantities with vermiculite or other absorbent material.  
Place spilled material in clean, dry, sealable, labelled container.

#### **MAJOR SPILLS**

Minor hazard.

- Clear area of personnel.
- Alert Fire Brigade and tell them location and nature of hazard.
- Control personal contact by using protective equipment as required.
- Prevent spillage from entering drains or water ways.
- Contain spill with sand, earth or vermiculite.
- Collect recoverable product into labelled containers for recycling.
- Absorb remaining product with sand, earth or vermiculite and place in appropriate containers for disposal.
- Wash area and prevent runoff into drains or waterways.
- If contamination of drains or waterways occurs, advise emergency services.

### **EMERGENCY RESPONSE PLANNING GUIDELINES (ERPG)**

The maximum airborne concentration below which it is believed that nearly all individuals could be exposed for up to one hour WITHOUT experiencing or developing

life-threatening health effects is:  
ethylene glycol 300ppm

irreversible or other serious effects or symptoms which could impair an individual's ability to take protective action is:  
ethylene glycol 200ppm

other than mild, transient adverse effects without perceiving a clearly defined odour is:  
ethylene glycol 50ppm

American Industrial Hygiene Association (AIHA)

Ingredients considered according to the following cutoffs

Very Toxic (T+) >= 0.1%	Toxic (T) >= 3.0%
R50 >= 0.25%	Corrosive (C) >= 5.0%
R51 >= 2.5%	
else >= 10%	

where percentage is percentage of ingredient found in the mixture

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

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

### **PROCEDURE FOR HANDLING**

- Limit all unnecessary personal contact.
- Wear protective clothing when risk of exposure occurs.
- Use in a well-ventilated area.
- When handling DO NOT eat, drink or smoke.
- Always wash hands with soap and water after handling.
- Avoid physical damage to containers.
- Use good occupational work practice.
- Observe manufacturer's storing and handling recommendations.

### **SUITABLE CONTAINER**

- Polyethylene or polypropylene container.
- Packing as recommended by manufacturer.
- Check all containers are clearly labelled and free from leaks.

### **STORAGE INCOMPATIBILITY**

Avoid storage with oxidisers.

### **STORAGE REQUIREMENTS**

- Store in original containers.
- Keep containers securely sealed.
- Store in a cool, dry, well-ventilated area.
- Store away from incompatible materials and foodstuff containers.
- 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 (Ethylene glycol vapour)	20	52	40	104
Australia Exposure Standards	ethylene glycol (Ethylene glycol particulate))		10		
Australia Exposure Standards	glycerol (Glycerin mist (a))		10		

ENDOELTABLE

The following materials had no OELs on our records

- water: CAS:7732-18-5

### MATERIAL DATA

None assigned. Refer to individual constituents.

### INGREDIENT DATA

#### ETHYLENE GLYCOL:

Odour Threshold: 25 ppm

NOTE: Detector tubes for ethylene glycol, measuring in excess of 10 mg/m<sup>3</sup>, are commercially available.

It appears impractical to establish separate TLVs for ethylene glycol vapour and mists. Atmospheric concentration that do not cause discomfort are unlikely to cause adverse effects. The TLV-C is thought to be protective against throat and respiratory irritation and headache reported in exposed humans. NIOSH has not established a limit for this substance due to the potential teratogenicity associated with exposure and because respiratory irritation reported at the TLV justified a lower value.

#### GLYCEROL:

The mist is considered to be a nuisance particulate which appears to have little adverse effect on the lung and does not produce significant organic disease or toxic effects. OSHA concluded that this limit would protect the worker from kidney damage and perhaps, testicular effects.

#### WATER:

No exposure limits set by NOHSC or ACGIH.

## 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 P	-
1000	50	-	A-AUS P
5000	50	Airline *	-
5000	100	-	A-2 P
10000	100	-	A-3 P
	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 liquid with a sweet taste; 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 available

Volatile Component (%vol): Not available

Relative Vapour Density (air=1): Not available

Lower Explosive Limit (%): Not applicable

Autoignition Temp (°C): Not available

State: Liquid

Boiling Range (°C): 100 (initial)

Specific Gravity (water=1): 1.120

pH (as supplied): Not available

Vapour Pressure (kPa): As for water.

Evaporation Rate: <1 BuAc=1

Flash Point (°C): Not applicable

Upper Explosive Limit (%): Not applicable

Decomposition Temp (°C): Not available.

## 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 may be harmful if swallowed.

Considered an unlikely route of entry in commercial/industrial environments.

#### EYE

The liquid may produce eye discomfort causing smarting, pain and redness.

The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.



## SKIN

The material may be slightly discomforting to the skin from repeated exposures over long periods or if exposure is prolonged.

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

Not normally a hazard due to non-volatile nature of product.

## CHRONIC HEALTH EFFECTS

As with any chemical product, contact with unprotected bare skin; inhalation of vapour, mist or dust in work place atmosphere; or ingestion in any form, should be avoided by observing good occupational work practice.

## TOXICITY AND IRRITATION

Not available. Refer to individual constituents.

### ETHYLENE GLYCOL:

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

#### TOXICITY

Oral (rat) LD50: 4700 mg/kg

Oral (human) LDLo: 398 mg/kg

Oral (child) TDLo: 5500 mg/kg

Inhalation (human) TClO: 10000 mg/m<sup>3</sup>

Dermal (rabbit) LD50: 9530 mg/kg

Inhalation (rat) LC50: 50100 mg/m<sup>3</sup>/8 hr

[Estimated Lethal Dose (human) 100 ml; RTECS quoted by Orica]

Substance is reproductive effector in rats (birth defects).

Mutagenic to rat cells.

#### IRRITATION

Skin (rabbit): 555 mg(open)-Mild

Eye (rabbit): 100 mg/1h - Mild

Eye (rabbit): 1440mg/6h-Moderate

Eye (rabbit): 500 mg/24h - Mild

Eye (rabbit): 12 mg/m<sup>3</sup>/3D

### GLYCEROL:

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

#### TOXICITY

Oral (Rat) LD50: 12600 mg/kg

The material may be irritating to the eye, with prolonged contact causing 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.

#### IRRITATION

### WATER:

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

No significant acute toxicological data identified in literature search.

## Section 12 - ECOLOGICAL INFORMATION

No data for Zeus 9059 Water Sol. Invisible Ink.

Refer to data for ingredients, which follows:

#### ETHYLENE GLYCOL:

Hazardous Air Pollutant:	Yes
Fish LC50 (96hr.) (mg/l):	18500- 4100
Algae IC50 (72hr.) (mg/l):	180000
log Kow (Prager 1995):	- 1.36
log Kow (Sangster 1997):	- 1.36
log Pow (Verschueren 1983):	- 1.93
BOD5:	35%
COD:	94%
ThOD:	1.26
Half- life Soil - High (hours):	288
Half- life Soil - Low (hours):	48
Half- life Air - High (hours):	83
Half- life Air - Low (hours):	8.3
Half- life Surface water - High (hours):	288
Half- life Surface water - Low (hours):	48
Half- life Ground water - High (hours):	576
Half- life Ground water - Low (hours):	96
Aqueous biodegradation - Aerobic - High (hours):	288
Aqueous biodegradation - Aerobic - Low (hours):	48
Aqueous biodegradation - Anaerobic - High (hours):	1152
Aqueous biodegradation - Anaerobic - Low (hours):	192
Aqueous biodegradation - Removal secondary treatment - High (hours):	100%
Aqueous biodegradation - Removal secondary treatment - Low (hours):	80%
Photooxidation half- life water - High (hours):	566000
Photooxidation half- life water - Low (hours):	6400
Photooxidation half- life air - High (hours):	83
Photooxidation half- life air - Low (hours):	8.3

DO NOT discharge into sewer or waterways.

log Kow: -1.93- -1.36

Half-life (hr) air: 24

Henry's atm m<sup>3</sup> /mol: 6.00E-08

BOD 5 if unstated: 0.15-0.81,12%

COD: 1.21-1.29

ThOD: 1.26

BCF: 10-190

Toxicity Fish: LC50(96)118-550mg/L

Toxicity invertebrate: cell mult. inhib.135-1127mg/L

Bioaccumulation: not sig

Nitrif. inhib.: inhib at 125mg/L

Anaerobic effects: no degrad

Effects on algae and plankton: cell mult. inhib. algae 105-710mg/L

Degradation Biological: little

processes Abiotic: photol&hydrol notsig,RxnOH\*

In the atmosphere ethylene glycol exists mainly in the vapour phase. It is degraded in the atmosphere by reaction with photochemically produced hydroxy radicals (estimated half-life 24-50 hours).

Ethylene glycol does not concentrate in the food chain.

#### GLYCEROL:

Algae IC50 (72hr.) (mg/l):	2900- 10000
log Kow (Sangster 1997):	- 1.76
log Pow (Verschueren 1983):	1.07692307
BOD5:	51%
COD:	95%
ThOD:	93%

DO NOT discharge into sewer or waterways.

log Kow: -2.66- -2.47

BOD 5 if unstated: 0.617-0.87,31-51%

COD: 1.16,82-95%

ThOD: 1.217-1.56

Completely biodegradable.

Fish LC50: >5000 mg/l

Algae IC50: >2900 mg/l

Bacteria EC50: .10000 mg/l (Pseudomonas putida)

## Section 13 - DISPOSAL CONSIDERATIONS

- Recycle wherever possible or consult manufacturer for recycling options.
- Consult State Land Waste Management Authority for disposal.
- Bury residue in an authorised landfill.
- Recycle containers if possible, or dispose of in an authorised landfill.

## Section 14 - TRANSPORTATION INFORMATION

HAZCHEM: None

NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS:UN, IATA, IMDG

## Section 15 - REGULATORY INFORMATION

POISONS SCHEDULE: None

### REGULATIONS

Zeus 9059 Water Sol. Invisible Ink (CAS: None):  
No regulations applicable

ethylene glycol (CAS: 107-21-1) 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) - Appendix E (Part 2)
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 5
- Australia Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP) - Schedule 6
- IMO IBC Code Chapter 17: Summary of minimum requirements
- IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
- IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
- International Council of Chemical Associations (ICCA) - High Production Volume List
- OECD Representative List of High Production Volume (HPV) Chemicals

glycerol (CAS: 56-81-5) is found on the following regulatory lists;

- Australia Exposure Standards
- Australia High Volume Industrial Chemical List (HVICL)
- Australia Inventory of Chemical Substances (AICS)
- Australia Therapeutic Goods Administration (TGA) Substances that may be used as active ingredients in Listed medicines
- CODEX General Standard for Food Additives (GSFA) - Additives Permitted for Use in Food in General, Unless Otherwise Specified, in Accordance with GMP
- 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 Council of Chemical Associations (ICCA) - High Production Volume List
- OECD Representative List of High Production Volume (HPV) Chemicals

water (CAS: 7732-18-5) is found on the following regulatory lists;

- Australia Inventory of Chemical Substances (AICS)
- IMO IBC Code Chapter 18: List of products to which the Code does not apply
- OECD Representative List of High Production Volume (HPV) Chemicals
- United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II

## Section 16 - OTHER INFORMATION

### REPRODUCTIVE HEALTH GUIDELINES

Ingredient	ORG	UF	Endpoi	CR	Adeq
		nt	TLV		
ethylene glycol	26 mg/m <sup>3</sup>	100	R	NA	-

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).

### EXPOSURE STANDARD FOR MIXTURES

"Worst Case" computer-aided prediction of spray/ mist or fume/ dust components and concentration:

Composite Exposure Standard for Mixture (TWA) :100 mg/m<sup>3</sup>.

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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