

ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
 For Domestic Use Only.
 Issue Date: 29-Sep-2008
 XC9477SD

CHEMWATCH 1294
 Version No:2.0
 CD 2008/4 Page 1 of 9

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME

ANDREW TOLUENE

STATEMENT OF HAZARDOUS NATURE

Considered a Hazardous Substance according to the criteria of the New Zealand Hazardous Substances New Organisms legislation.

OTHER NAMES

C7-H8, C6H5CH3, "1 degree toluene", methylbenzene, "methyl benzene", "methyl benzol", phenylmethane, "methane, phenyl-", methacide, ME-752, toluol, toly, toly, tollie, tolie, "BP Toluene", "Shell Toluene", "Shell Toluol", "Shell Methyl Benzene", "Bauer Industries Thinner", "Exxon 12645", "Selby Toluene, Pronalys BSPTL786"

PROPER SHIPPING NAME

TOLUENE

PRODUCT USE

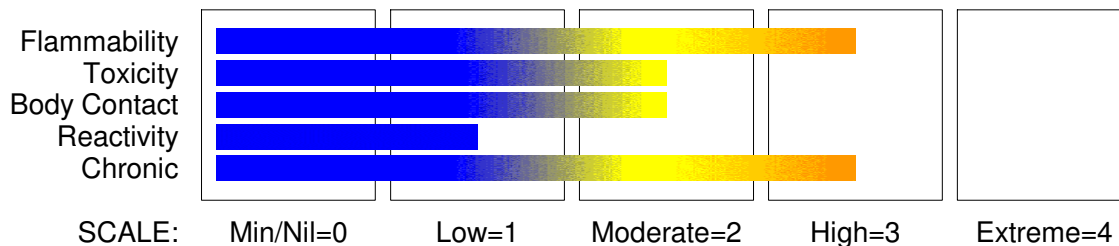
» The use of a quantity of material in an unventilated or confined space may result in increased exposure and an irritating atmosphere developing. Before starting consider control of exposure by mechanical ventilation.
 WARNING: Intentional misuse by concentrating/inhaling contents may be lethal.
 Used as a solvent for paint, resins, lacquers inks & adhesives. Component of solvent blends and thinners; in gasoline and aviation fuel. Used in the manufacture of chemicals, dyes, explosives, benzoic acid. Some grades of toluene may contain traces of xylene and benzene. Odour threshold: 2 ppm approx. Odour is not a reliable warning property due to olfactory fatigue.

SUPPLIER

Company: Damar Industries Limited
 Address:
 Eastgate Business Park
 800 Te Ngae Road
 Rotorua
 Telephone: +64 7 345 6007
 Emergency Tel: 0800 2436 2255
 Emergency Tel: 0800 CHEMCALL
 Fax: +64 7 345 6019

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS



GHS Classification

Acute Toxicity (Oral) Category 4
 Chronic Aquatic Hazard Category 4
 Eye Irritation Category 2A
 Flammable Liquid Category 2
 Organ Damage single exposure Category 2

ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 2 of 9
Section 2 - HAZARDS IDENTIFICATION

Reproductive Toxicity Category 2
Skin Corrosion/Irritation Category 2



EMERGENCY OVERVIEW

HAZARD

DANGER

Gazetted by ERMANZ:

3.1B 6.1D 6.3A 6.4A 6.8B 6.9B 9.1D 9.3C

Highly flammable liquid and vapour

Harmful if swallowed

Causes skin irritation

Causes serious eye irritation

Suspected of damaging fertility

May cause damage to organs by skin contact.

May cause long lasting harmful effects to aquatic life.

Harmful to terrestrial vertebrates

PRECAUTIONARY STATEMENTS

Prevention

Obtain special instructions before use.

Do not handle until all safety precautions have been read and understood.

Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

Keep container tightly closed.

Ground/bond container and receiving equipment.

Use explosion-proof electrical/ventilating/lighting equipment

Use only non-sparking tools.

Take precautionary measures against static discharge.

Do not breathe dust/fume/gas/mist/vapours/spray.

Wash thoroughly after handling.

Do not eat, drink or smoke when using this product.

Avoid release to the environment.

Wear protective gloves/protective clothing/eye protection/face protection.

Use personal protective equipment as required.

Response

IF SWALLOWED: Call a POISON CENTER or doctor/physician if you feel unwell.

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue

rinsing.

IF exposed or concerned: Get medical advice/ attention.

IF exposed or if you feel unwell: Call a POISON CENTER or doctor/physician.

Rinse mouth.

If eye irritation persists: Get medical advice/attention.

Storage

Store in a well-ventilated place. Keep cool.

Store locked up.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
toluene	108-88-3	> 99.5
Industrial grades of toluene may contain benzene. See toluene, industrial.		

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ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 3 of 9

Section 4 - FIRST AID MEASURES

NEW ZEALAND POISONS INFORMATION CENTRE 0800 POISON (0800 764 766)
NZ EMERGENCY SERVICES: 111

SWALLOWED

- If swallowed do NOT induce vomiting.
- If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration.
Avoid giving milk or oils.
Avoid giving alcohol.
- If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

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.

SKIN

- » If skin contact occurs:
- Immediately remove all contaminated clothing, including footwear.
- Flush skin and hair with running water (and soap if available).

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN

» Any material aspirated during vomiting may produce lung injury. Therefore emesis should not be induced mechanically or pharmacologically.
Following acute or short term repeated exposures to toluene:

- Toluene is absorbed across the alveolar barrier, the blood/air mixture being 11.2/15.6 (at 37 degrees C.) The concentration of toluene, in expired breath, is of the order of 18 ppm following sustained exposure to 100 ppm. The tissue/blood proportion is 1/3 except in adipose where the proportion is 8/10.
- Metabolism by microsomal mono-oxygenation, results in the production of hippuric acid. This may be detected in the urine in amounts between 0.5 and 2.5 g/24 hr which represents, on average 0.8 gm/gm of creatinine. The biological half-life of hippuric acid is in the order of 1-2 hours.

Section 5 - FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Fire Brigade and tell them location and nature of hazard.
 - May be violently or explosively reactive.
- When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 1000 metres in all directions.

FIRE/EXPLOSION HAZARD

- Liquid and vapour are highly flammable.
 - Severe fire hazard when exposed to heat, flame and/or oxidisers.
- Combustion products include: carbon dioxide (CO₂), other pyrolysis products typical of burning organic material.
Contains low boiling substance: Closed containers may rupture due to pressure buildup under fire conditions.

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ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 4 of 9
Section 5 - FIRE FIGHTING MEASURES

FIRE INCOMPATIBILITY

- Avoid contamination with oxidising agents i.e. nitrates, oxidising acids, chlorine bleaches, pool chlorine etc. as ignition may result.

Section 6 - ACCIDENTAL RELEASE MEASURES

EMERGENCY PROCEDURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Fire Brigade and tell them location and nature of hazard.

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

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Containers, even those that have been emptied, may contain explosive vapours.
 - Do NOT cut, drill, grind, weld or perform similar operations on or near containers.
- Contains low boiling substance:
Storage in sealed containers may result in pressure buildup causing violent rupture of containers not rated appropriately.
- Check for bulging containers.
 - Vent periodically.
 - DO NOT allow clothing wet with material to stay in contact with skin.
 - Electrostatic discharge may be generated during pumping - this may result in fire.
 - Ensure electrical continuity by bonding and grounding (earthing) all equipment.
 - Avoid all personal contact, including inhalation.
 - Wear protective clothing when risk of exposure occurs.

SUITABLE CONTAINER

- Packing as supplied by manufacturer.
- Plastic containers may only be used if approved for flammable liquid.
- For low viscosity materials (i) : Drums and jerry cans must be of the non-removable head type. (ii) : Where a can is to be used as an inner package, the can must have a screwed enclosure.
- For materials with a viscosity of at least 2680 cSt. (23 deg. C).

STORAGE INCOMPATIBILITY

- » Toluene:
- reacts violently with strong oxidisers, bromine, bromine trifluoride, chlorine, hydrochloric acid/ sulfuric acid mixture, 1,3-dichloro-5,5-dimethyl-2,4-imidazolidindione, dinitrogen tetraoxide, fluorine, concentrated nitric acid, nitrogen dioxide, silver chloride, sulfur dichloride, uranium fluoride, vinyl acetate
 - forms explosive mixtures with strong acids, strong oxidisers, silver perchlorate, tetranitromethane
 - is incompatible with bis-toluenediazo oxide
 - attacks some plastics, rubber and coatings
 - may generate electrostatic charges, due to low conductivity, on flow or agitation.
 - Vigorous reactions, sometimes amounting to explosions, can result from the contact between aromatic rings and strong oxidising agents.
 - Aromatics can react exothermically with bases and with diazo compounds.

STORAGE REQUIREMENTS

- Store in original containers in approved flame-proof area.
- No smoking, naked lights, heat or ignition sources.

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ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 5 of 9

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m ³
New Zealand Workplace Exposure Standards (WES)	toluene (Toluene)	50	188

PERSONAL PROTECTION



RESPIRATOR

Type A Filter of sufficient capacity

EYE

- Safety glasses with side shields.
- Chemical goggles.

HANDS/FEET

- Wear chemical protective gloves, eg. PVC.
 - Wear safety footwear or safety gumboots, eg. Rubber.
- Suitability and durability of glove type is dependent on usage. Factors such as:
- frequency and duration of contact,
 - chemical resistance of glove material,

OTHER

- Overalls.
- PVC Apron.
- Some plastic personal protective equipment (PPE) (e.g. gloves, aprons, overshoes) are not recommended as they may produce static electricity.

ENGINEERING CONTROLS

» For flammable liquids and flammable gases, local exhaust ventilation or a process enclosure ventilation system may be required.
Ventilation equipment should be explosion-resistant.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE

Clear highly flammable liquid with a strong aromatic odour; floats on water. Mixes with most organic solvents.

PHYSICAL PROPERTIES

Liquid.
Does not mix with water.
Floats on water.

Molecular Weight: 92.14
Melting Range (°C): - 95
Solubility in water (g/L): Immiscible
pH (1% solution): Not applicable.
Volatile Component (%vol): 100
Relative Vapour Density (air=1): 3.2
Lower Explosive Limit (%): 1.3
Autoignition Temp (°C): 529- 536
State: Liquid

Boiling Range (°C): 110.6
Specific Gravity (water=1): 0.87 @ 20 C
pH (as supplied): Not applicable
Vapour Pressure (kPa): 2.93 @ 20 C
Evaporation Rate: 2.4 BuAc=1
Flash Point (°C): 4.4
Upper Explosive Limit (%): 7.0
Decomposition Temp (°C): Not Available
Viscosity: Not Available

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ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 6 of 9

Section 10 - CHEMICAL STABILITY AND REACTIVITY INFORMATION

CONDITIONS CONTRIBUTING TO INSTABILITY

- Presence of incompatible materials.
- Product is considered stable.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

- » Harmful if swallowed.
- » HARMFUL- May cause lung damage if swallowed.
- » Irritating to eyes and skin.

- » Vapours may cause dizziness or suffocation.
- » Vapours may cause drowsiness and dizziness.
- » May produce discomfort of the respiratory system*.
- » Inhalation and/or skin contact may produce health damage*.
- » * (limited evidence).

CHRONIC HEALTH EFFECTS

- » Possible risk of harm to the unborn child.
- » Limited evidence of a carcinogenic effect*.
- » Cumulative effects may result following exposure*.
- » * (limited evidence).

TOXICITY AND IRRITATION

» The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling of the epidermis.

For toluene:

Acute Toxicity

Humans exposed to intermediate to high levels of toluene for short periods of time experience adverse central nervous system effects ranging from headaches

to intoxication, convulsions, narcosis, and death. Similar effects are observed in short-term animal studies.

Humans - Toluene ingestion or inhalation can result in severe central nervous system depression, and in large doses, can act as a narcotic. The ingestion

of about 60 mL resulted in fatal nervous system depression within 30 minutes in one reported case.

Constriction and necrosis of myocardial fibers, markedly swollen liver, congestion and haemorrhage of the lungs and acute tubular necrosis were found on autopsy.

Central nervous system effects (headaches, dizziness, intoxication) and eye irritation occurred following inhalation exposure to 100 ppm toluene 6 hours/day for 4 days.

Exposure to 600 ppm for 8 hours resulted in the same and more serious symptoms including euphoria, dilated pupils, convulsions, and nausea. Exposure to 10,

000-30,000 ppm has been reported to cause narcosis and death

Toluene can also strip the skin of lipids causing dermatitis

Animals - The initial effects are instability and incoordination, lachrymation and sniffles (respiratory exposure), followed by narcosis. Animals die of

respiratory failure from severe nervous system depression. Cloudy swelling of the kidneys was reported in rats following inhalation exposure to 1600 ppm,

18-20 hours/day for 3 days

Subchronic/Chronic Effects:

Repeat doses of toluene cause adverse central nervous system effects and can damage the upper respiratory system, the liver, and the kidney. Adverse

effects occur as a result from both oral and the inhalation exposures. A reported lowest-observed-effect level in humans for adverse neurobehavioral effects is 88 ppm.

Humans - Chronic occupational exposure and incidences of toluene abuse have resulted in hepatomegaly and liver function changes. It has also resulted in

nephrotoxicity and, in one case, was a cardiac sensitizer and fatal cardiotoxin.

Neural and cerebellar dystrophy were reported in several cases of habitual "glue sniffing." An epidemiological study in France on workers chronically

exposed to toluene fumes reported leukopenia and neutropenia. Exposure levels were not given in the secondary reference; however, the average urinary

excretion of hippuric acid, a metabolite of toluene, was given as 4 g/L compared to a normal level of 0.6 g/L

Animals - The major target organs for the subchronic/chronic toxicity of toluene are the nervous system, liver, and kidney. Depressed immune response has

been reported in male mice given doses of 105 mg/kg/day for 28 days. Toluene in corn oil administered to F344 male and female rats by gavage 5 days/week

for 13 weeks, induced prostration, hypoactivity, ataxia, piloerection, lachrymation, excess salivation, and body tremors at doses 2500 mg/kg. Liver, kidney,

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ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 7 of 9
Section 11 - TOXICOLOGICAL INFORMATION

and heart weights were also increased at this dose and histopathologic lesions were seen in the liver, kidneys, brain and urinary bladder. The no-observed-adverse effect level (NOAEL) for the study was 312 mg/kg (223 mg/kg/day) and the lowest-observed-adverse effect level (LOAEL) for the study was 625 mg/kg (446 mg/kg/day) .

Developmental/Reproductive Toxicity

Exposures to high levels of toluene can result in adverse effects in the developing human foetus. Several studies have indicated that high levels of toluene can also adversely effect the developing offspring in laboratory animals.

Humans - Variable growth, microcephaly, CNS dysfunction, attentional deficits, minor craniofacial and limb abnormalities, and developmental delay were seen

in three children exposed to toluene in utero as a result of maternal solvent abuse before and during pregnancy
Animals - Sternebral alterations, extra ribs, and missing tails were reported following treatment of rats with 1500 mg/m³ toluene 24 hours/day during days

9-14 of gestation. Two of the dams died during the exposure. Another group of rats received 1000 mg/m³ 8 hours/day during days 1-21 of gestation. No

maternal deaths or toxicity occurred, however, minor skeletal retardation was present in the exposed fetuses. CFLP

Mice were exposed to 500 or 1500 mg/m³

toluene continuously during days 6-13 of pregnancy. All dams died at the high dose during the first 24 hours of exposure, however none died at 500 mg/m³.

Decreased foetal weight was reported, but there were no differences in the incidences of skeletal malformations or anomalies between the treated and control offspring.

Absorption - Studies in humans and animals have demonstrated that toluene is readily absorbed via the lungs and the gastrointestinal tract. Absorption

through the skin is estimated at about 1% of that absorbed by the lungs when exposed to toluene vapor.

Dermal absorption is expected to be higher upon exposure to the liquid; however, exposure is limited by the rapid evaporation of toluene .

Distribution - In studies with mice exposed to radiolabeled toluene by inhalation, high levels of radioactivity were present in body fat, bone marrow, spinal nerves, spinal cord, and brain white matter. Lower levels of radioactivity were present in blood, kidney, and liver. Accumulation of toluene has

generally been found in adipose tissue, other tissues with high fat content, and in highly vascularised tissues .

Metabolism - The metabolites of inhaled or ingested toluene include benzyl alcohol resulting from the hydroxylation of the methyl group. Further oxidation

results in the formation of benzaldehyde and benzoic acid. The latter is conjugated with glycine to yield hippuric acid or reacted with glucuronic acid to

form benzoyl glucuronide. o-cresol and p-cresol formed by ring hydroxylation are considered minor metabolites

Excretion - Toluene is primarily (60-70%) excreted through the urine as hippuric acid. The excretion of benzoyl glucuronide accounts for 10-20%, and

excretion of unchanged toluene through the lungs also accounts for 10-20%. Excretion of hippuric acid is usually complete within 24 hours after exposure.

CARCINOGEN

toluene	International Agency for Research on Cancer (IARC) Carcinogens	Group	3
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REPROTOXIN

toluene	ILO Chemicals in the electronics industry that have toxic effects on reproduction	Reduced fertility or sterility
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SKIN

toluene	New Zealand Workplace Exposure Standards (WES) - Skin	Notes	Skin
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Section 12 - ECOLOGICAL INFORMATION

This material and its container must be disposed of as hazardous waste.

Section 13 - DISPOSAL CONSIDERATIONS

- Recycle where possible
Otherwise ensure that:
- licenced contractors dispose of the product and its container.

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ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 8 of 9

Section 14 - TRANSPORTATION INFORMATION



Labels Required: FLAMMABLE LIQUID
HAZCHEM: None

UNDG:

Dangerous Goods Class:	3	Subrisk:	None
UN Number:	1294	Packing Group:	II
Shipping Name:	TOLUENE		

Air Transport IATA:

ICAO/IATA Class:	3	ICAO/IATA Subrisk:	None
UN/ID Number:	1294	Packing Group:	II
Special provisions:	None		
Shipping Name:	TOLUENE		

Maritime Transport IMDG:

IMDG Class:	3	IMDG Subrisk:	None
UN Number:	1294	Packing Group:	II
EMS Number:	F- E, S- D	Special provisions:	None
Limited Quantities:	1 L		
Shipping Name:	TOLUENE		

Section 15 - REGULATORY INFORMATION

REGULATIONS

toluene (CAS: 108-88-3) is found on the following regulatory lists;

- GESAMP/EHS Composite List of Hazard Profiles - Hazard evaluation of substances transported by ships
- IMO IBC Code Chapter 17: Summary of minimum requirements
- IMO MARPOL 73/78 (Annex II) - List of Noxious Liquid Substances Carried in Bulk
- IMO Provisional Categorization of Liquid Substances - List 1: Pure or technically pure products
- International Agency for Research on Cancer (IARC) Carcinogens
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Dangerous Goods
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Hazardous Substances Register
- New Zealand Hazardous Substances and New Organisms (HSNO) Act - Pesticides
- New Zealand Inventory of Chemicals (NZIoC)
- New Zealand Poisons Schedule [NLV]
- New Zealand Workplace Exposure Standards (WES)
- OECD Representative List of High Production Volume (HPV) Chemicals
- United Nations Convention Against Illicit Traffic in Narcotic Drugs and Psychotropic Substances - Table II
- United Nations List of Precursors and Chemicals Frequently used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances Under International Control - Table II
- WHO Guidelines for Drinking-water Quality - Guideline values for chemicals that are of health significance in drinking-water

Specific advice on controls required for materials used in New Zealand can be found at <http://www.ermanz.govt.nz/search/registers.html>

Section 16 - OTHER INFORMATION

NEW ZEALAND POISONS INFORMATION CENTRE

0800 POISON (0800 764 766)

NZ EMERGENCY SERVICES: 111

» 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.

» The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether

continued...

ANDREW TOLUENE

Chemwatch Material Safety Data Sheet
For Domestic Use Only.
Issue Date: 29-Sep-2008
XC9477SD

CHEMWATCH 1294
Version No:2.0
CD 2008/4 Page 9 of 9
Section 16 - OTHER INFORMATION

the reported Hazards are Risks in the workplace or other settings.

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