



DOW CHEMICAL CANADA INC. MATERIAL SAFETY DATA SHEET



Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 1 of 15

Dow (hereinafter, and for purposes of this MSDS only, refers to The Dow Chemical Company and to Dow Chemical Canada Inc.) encourages and expects you to read and understand the entire MSDS, as there is important information throughout the document. Dow expects you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1.1 IDENTIFICATION

Product Name TRITON(TM) X-100 SURFACTANT

1.2 COMPANY IDENTIFICATION

Supplier:

Dow Chemical Canada Inc.
1425 S. Vidal Street, P.O. Box 3030
Sarnia, Ontario N7T 8C6

Prepared By: Prepared for use in Canada by EH&S, Product Regulatory
Management Department.

Print Date: 2002 02 27

1.3 EMERGENCY TELEPHONE NUMBER

24-HOUR EMERGENCY PHONE NUMBER: (519) 339-3711
Customer Information Number: 1-800-331-6451

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 2 of 15

2. COMPOSITION INFORMATION

Component	CAS #	%W/W	Hazard
Glycols, polyethylene, mono[(1,1,3,3-tetramethylbutyl)phenyl] ether	9036-19-5	>= 97 <= 100%	toxic
Polyethylene glycol	25322-68-3	< 3%	WHMIS: not hazardous

3. HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Appearance Transparent pale yellow

Physical State Liquid

Odor Mild

Hazards of product DANGER! CAUSES EYE BURNS.
HARMFUL IF SWALLOWED.
CAUSES SKIN IRRITATION.
PLASTIC CONTAINER, IF PRESENT, MAY CAUSE
STATIC IGNITION HAZARD.

ASPIRATION MAY CAUSE LUNG DAMAGE.

3.2 POTENTIAL HEALTH EFFECTS

Potential Effects of a Single Acute Exposure

Inhalation Mist may cause irritation of the respiratory tract, experienced as nasal discomfort and discharge, with chest pain and coughing.

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 3 of 15

Eye Contact Causes severe irritation, experienced as discomfort or pain, excess blinking and tear production, marked excess redness and swelling of the conjunctiva, and chemical burns of the cornea. Iritis may occur.

Skin Contact Brief contact is not irritating. Prolonged or repeated contact may cause discomfort and local redness.

Skin Absorption No evidence of harmful effects from available information.

Swallowing Moderately toxic. May cause abdominal discomfort, nausea, vomiting, and diarrhea. Aspiration into the lungs may occur during ingestion or vomiting, resulting in lung injury.

Chronic, Prolonged or Repeated Exposure

Potential Effects of Repeated Exposure No adverse effects anticipated from available information.

Other Potential Effects of Exposure None currently known.

Medical Conditions Aggravated by Exposure

A knowledge of the available toxicology information and of the physical and chemical properties of the material suggests that exposure is unlikely to aggravate existing medical conditions.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

Toxic to aquatic organisms.

4. FIRST AID PROCEDURES

4.1 INHALATION

If any symptoms develop, remove to fresh air.

4.2 EYE CONTACT

Immediately flush eyes with water and continue washing for at least 15 minutes. DO NOT remove contact lenses, if worn. Obtain medical attention without delay, preferably from an ophthalmologist.

4.3 SKIN CONTACT

Remove contaminated clothing. Wash skin with soap and water. Obtain medical attention if irritation persists. Wash clothing before reuse.

4.4 SWALLOWING

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 4 of 15

If patient is fully conscious, give two glasses of water. DO NOT INDUCE VOMITING. Obtain medical attention.

4.5 NOTES TO PHYSICIAN

There is no specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

Any material aspirated during vomiting may cause lung injury. Therefore, emesis should not be induced mechanically or pharmacologically. If it is considered necessary to evacuate the stomach contents, this should be done by means least likely to cause aspiration (e.g., gastric lavage after endotracheal intubation).

5. FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Flash Point - Closed Cup: *Pensky-Martens Closed Cup ASTM D 93* 251 °C 485 °F

Flash Point - Open Cup: *Cleveland Open Cup ASTM D 92* 290 °C 555 °F

Autoignition Temperature: *Not currently available.*

Flammable Limits In Air:

Lower *Not determined.*

Upper *Not determined.*

5.2 EXTINGUISHING MEDIA

Extinguish fires with water spray or apply alcohol-type or all-purpose-type foam by manufacturer's recommended techniques for large fires. Use carbon dioxide or dry chemical media for small fires.

5.3 EXTINGUISHING MEDIA TO AVOID

No information currently available.

5.4 SPECIAL FIRE FIGHTING PROCEDURES

Do not direct a solid stream of water or foam into hot, burning pools; this may cause frothing and increase fire intensity.

5.5 SPECIAL PROTECTIVE EQUIPMENT FOR FIREFIGHTERS

Use self-contained breathing apparatus and protective clothing.

5.6 UNUSUAL FIRE AND EXPLOSION HAZARDS

See Section 8.3 - Engineering Controls

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 5 of 15

This material may produce a floating fire hazard.

5.7 HAZARDOUS COMBUSTION PRODUCTS

Burning can produce the following products: Carbon monoxide and/or carbon dioxide. Carbon monoxide is highly toxic if inhaled; carbon dioxide in sufficient concentrations can act as an asphyxiant.

6. ACCIDENTAL RELEASE MEASURES

Steps to be Taken if Material is Released or Spilled:

Contain spills immediately with inert materials (e.g., sand, earth). Transfer liquids and solid diking material to suitable containers for recovery or disposal. To avoid gelling and foaming problems, do not use water to flush away spills.

Personal Precautions: Wear eye and skin protection. Floor may be slippery; use care to avoid falling. See Section 8.2 - Personal Protection.

Environmental Precautions: Avoid discharge to natural waters.

7. HANDLING AND STORAGE

7.1 HANDLING

General Handling

Do not get in eyes.
Do not swallow.
Avoid contact with skin and clothing.
Do not handle or empty in presence of flammable vapor.
Keep container closed.
Use with adequate ventilation.
Wash thoroughly after handling.

FOR INDUSTRY USE ONLY.

Ventilation

General (mechanical) room ventilation is expected to be satisfactory.

Other Precautions

This product may contain trace amounts of ethylene oxide (CAS No. 75-21-8), a condition which creates the potential for accumulation of ethylene oxide in the head space of shipping and storage containers and in enclosed areas where the product is being handled or used. Ethylene oxide is listed by OSHA as probably carcinogenic to humans, IARC as carcinogenic to humans,

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 6 of 15

and NTP as known to be a human carcinogen. OSHA considers that, at excessive levels, ethylene oxide may present reproductive, mutagenic, genotoxic, neurologic and sensitization hazards. If this product is handled with adequate ventilation, the presence of these trace amounts is not expected to result in any short or long term hazard. Personnel should be monitored to determine levels of exposure to ethylene oxide. If necessary, protective measures should be taken. The ACGIH TLV is 1 ppm TWA8.

7.2 STORAGE

Store in accordance with good industrial practices. Storage information may be obtained from product-specific Storage and Handling Guides, or by calling Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada).

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

8.1 EXPOSURE LIMITS

Polyethylene glycol 10 mg/m³ TWA8 AIHA WEEL Aerosol
There are no ACGIH or Dow exposure limits for this product; however, consult local authorities for recommended exposure limits.

8.2 PERSONAL PROTECTION

Respiratory Protection: None expected to be needed. However, where misting may occur, wear a MSHA/NIOSH approved (or equivalent) half-mask air purifying respirator.

Ventilation: General (mechanical) room ventilation is expected to be satisfactory.

Eye Protection: Monogoggles

Protective Gloves: Polyvinyl chloride coated

Other Protective Equipment: Eye bath, safety shower, chemical apron.

8.3 ENGINEERING CONTROLS

Surfactants can cause foaming problems in biological wastewater treatment plants and other high shear operations.

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 7 of 15

PROCESS HAZARD: Sudden release of hot organic chemical vapor or mists from process equipment operating at elevated temperature and pressure, or sudden ingress of air into hot equipment under a vacuum, may result in ignitions without the presence of obvious ignition sources. Published "autoignition" or "ignition" temperature values cannot be treated as safe operating temperatures in chemical processes without analysis of the actual process conditions. Any use of this product in elevated-temperature processes should be thoroughly evaluated to establish and maintain safe operating conditions. Further information is available in a technical bulletin entitled "Ignition Hazards of Organic Chemical Vapor."

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State: Liquid

Appearance: Transparent pale yellow

pH: 9.7

Solubility in Water (by weight): Completely soluble but some compositions may form gels

Odor: Mild

Flash Point - Closed Cup: *Pensky-Martens Closed Cup ASTM D 93* 251 °C 485 °F

Flash Point - Open Cup: *Cleveland Open Cup ASTM D 92* 290 °C 555 °F

Percent Volatiles: 0.0065 Wt%

Molecular Weight: 624 g/mol (Average)

Boiling Point (760 mmHg): > 200 °C > 392 °F

Freezing Point: 6 °C 43 °F

Specific Gravity (H₂O = 1): 1.067 20 °C / 20 °C

Vapor Pressure: 20 °C < 0.01 mmHg

Vapor Density (air = 1): > 1

Evaporation Rate (Butyl Acetate = 1): < 0.01

Melting Point: *Not applicable.*

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 8 of 15

10. STABILITY AND REACTIVITY

10.1 STABILITY/INSTABILITY Stable

Conditions to Avoid: Prolonged excessive heat may cause product decomposition.

Incompatible Materials: Normally unreactive; however, avoid strong bases at high temperatures, strong acids, strong oxidizing agents and materials reactive with hydroxyl compounds.

10.2 HAZARDOUS POLYMERIZATION Will not occur.

10.3 INHIBITORS/STABILIZERS Not applicable.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Peroral

Rat; female; LD50 = 707 (402 - 1240) mg/kg

Major Signs: sluggishness, unsteady gait, labored breathing, lacrimation, prostration, piloerection, encrustation on perinasal fur

Gross Pathology: lungs and liver discolored; stomach and intestines liquid-filled

Peroral

Rat; male = 500 mg/kg

Mortality: 0/3

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 9 of 15

Major Signs: sluggishness, unsteady gait, labored breathing, lacrimation, prostration, piloerection, encrustation on perinasal fur

Gross Pathology: lungs and liver discolored; stomach and intestines liquid-filled

Percutaneous

Rabbit; female; LD50 = 12.3 (9.13 - 16.7) g/kg; 24 h occluded.

Major Signs: sluggishness, labored breathing, gasping, wetness or staining on perioral and perinasal fur, emaciation

Gross Pathology: lungs, liver, kidneys and spleen discolored

Percutaneous

Rabbit; male = 8.0 g/kg; 24 h occluded.

Mortality: 2/3

Major Signs: sluggishness, labored breathing, gasping, wetness or staining on perioral and perinasal fur, emaciation

Gross Pathology: lungs, liver, kidneys and spleen discolored

IRRITATION

Skin: Rabbit; 4 h occluded

Results: minor to moderate erythema, minor edema

Eye: Rabbit; 0.1 ml

Results: minor to severe corneal injury with vascularization, iritis, moderate to severe conjunctival irritation with purulent discharge

Eye: Rabbit; 0.01 ml

Results: severe corneal injury, severe iritis and conjunctival irritation

SIGNIFICANT DATA WITH POSSIBLE RELEVANCE TO HUMANS

Rats fed dietary concentrations of the 40-mole ethoxylate of octylphenol(OPE40) up to 14000 ppm (700 mg/kg/day) for two years showed no adverse effects on growth or survival, feed consumption, hematologic values, urine measurements, organ weights or histopathologic lesions. In two-year feeding studies for related alkylphenol ethoxylates, the 4-mole ethoxylate of nonylphenol (NPE4) at doses of 200 mg/kg/day or 40 mg/kg/day in rats and dogs, respectively,

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 10 of 15

produced no significant effects. The 9-mole ethoxylate (NPE9) at doses of 140 or 30 mg/kg/day in the diet of rats or dogs, respectively, produced no adverse effects. Parameters evaluated included body and organ weights and histopathology of 28 tissues. A dose of 1000 mg/kg/day of NPE9 resulted in reduced body weights and enlarged livers in rats and reduced weight, emesis, and minimal blood changes in dogs. A dose of 88 mg/kg/day NPE9 produced increased liver to body weight ratios in dogs which was attributed to decreased feed consumption.

Alkylphenol Ethoxylate Toxicity: In studies with rabbits, sustained occluded skin contact of undiluted similar material caused inflammatory changes in the lung. Developmental effects including extra ribs and other skeletal variations were observed in the fetuses of rats treated with maternally toxic levels of a 9-mole ethoxylate of octylphenol, or a 4-mole or 9-mole ethoxylate of nonylphenol. The significance of these findings to humans is unclear as several human studies did not show any association of congenital effects in children with maternal exposure to spermicides containing octyl or nonylphenol ethoxylates. **Alkylphenol Toxicity:** In a 2-generation reproduction study with octylphenol at dietary concentrations of 0.2 to 2000 ppm, treatment-related effects in adult F0, F1, and F2 animals were limited to reduced body weights and food consumption at 2000 ppm. No effects on any reproductive parameters were observed in either generation. No effects on sperm measurements, estrous cyclicity, or reproductive organs were observed in adult animals. Pup body weights during lactation were reduced at 2000 ppm. The NOAEL for systemic and postnatal toxicity was 200 ppm (approximately 15 mg/kg/day) and for reproductive toxicity was >2000 ppm (approximately 150 mg/kg/day). Although octylphenol has weak estrogen mimetic activity in some screening assays, no estrogenic or reproductive effects occurred from dietary exposure to rats for two generations over a 10,000 fold dose range.

12. ECOLOGICAL INFORMATION

12.1 ENVIRONMENTAL FATE

BOD (% Oxygen consumption)

	Day 5	Day 10	Day 15	Day 20	Day 30
	30 %	40 %	49 %	51 %	

STURM (% Carbon dioxide evolved)

	Day 5	Day 10	Day 15	Day 28
				70 %

Closed Bottle BOD (% Oxygen consumption)

	Day 5	Day 10	Day 15	Day 28
	11 %		34 %	36 %

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 11 of 15

DOC (% dissolved organic carbon disappearance)

	Day 7	Day 14	Day 21	Day 28
	58 %	62 %	80 %	90 %

12.2 ECOTOXICITY

Toxicity to Micro-organisms

Bacterial Inhibition; IC50
Result value: 5000 mg/l

Toxicity to Aquatic Invertebrates

Daphnia; 48 h; LC50
Result value: 26 mg/l

Toxicity to Aquatic Invertebrates

Daphnia; 48 h; NOEC
Result value: 18 mg/l

Toxicity to Aquatic Invertebrates

Daphnia; 48 h; NOEC
Result value: 18 mg/l

Toxicity to Fish

Fathead Minnow; 96 h; NOEC
Result value: 3.2 mg/l

Toxicity to Fish

Fathead Minnow; 96 h; LC50
Result value: 8.9 mg/l

12.3 FURTHER INFORMATION

Based on available data for related alkylphenol ethoxylate (APE), appropriate treatment of effluents will reduce levels of octylphenol ethoxylate (OPE) residues to concentrations that should pose no harm to the environment, including protection for weak estrogen-mimetic activity observed in laboratory studies for some degradation intermediates.

Chemical Oxygen Demand (COD) - measured: 2.18 mg/mg

Chemical Oxygen Demand (COD) - measured: 2.19 mg/mg

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 12 of 15

13. DISPOSAL CONSIDERATIONS

13.1 DISPOSAL

DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. DOW HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION 2 (Composition/ Information On Ingredients). FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: incinerator or other thermal destruction device. waste water treatment system. As a service to its customers, Dow can provide names of information resources to help identify waste management companies and other facilities which recycle, reprocess or manage chemicals or plastics, and that manage used drums. Telephone Dow's Customer Information Group at 1-800-258-2436 or 1-989-832-1556 (U.S.), or 1-800-331-6451 (Canada) for further details .

Disposal methods identified are for the product as sold. For proper disposal of used material, an assessment must be completed to determine the proper and permissible waste management options permissible under applicable rules, regulations and/or laws governing your location.

14. TRANSPORT INFORMATION

14.1 TDG - CANADA

SMALL CONTAINER

Proper Shipping Name : NOT REGULATED

LARGE CONTAINER

Proper Shipping Name : NOT REGULATED

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 13 of 15

15. REGULATORY INFORMATION

15.1 FEDERAL/PROVINCIAL

HAZARDOUS PRODUCTS ACT INFORMATION: WHMIS CLASSIFICATION

The WHMIS classification for this product is as follows. Also, refer elsewhere in the MSDS for specific warnings and safe handling information; and refer to your employer's workplace education program.



Toxic Materials Causing
Other Effects

HAZARDOUS PRODUCTS ACT INFORMATION: HAZARDOUS INGREDIENTS

This product contains the following ingredients which are Controlled Products and/or are on the Ingredient Disclosure List (Canadian HPA Section 13 and 14)., Multiple ranges allow for variations in product composition due to variations in the manufacture of the product.

Component	CAS #	Amount
Glycols, polyethylene, mono[(1,1,3,3-tetramethylbutyl)phenyl] ether	9036-19-5	>= 97.0000 <= 100.0000%

HAZARDOUS PRODUCTS ACT INFORMATION: CPR COMPLIANCE

This product has been classified in accordance with the hazard criteria of the Canadian Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

TOXIC SUBSTANCES CONTROL ACT (TSCA)

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements.

EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS)

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 14 of 15

The components of this product are on the EINECS inventory or are exempt from EINECS inventory requirements.

CEPA - DOMESTIC SUBSTANCES LIST (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

VOC: Vapor pressure <0.01 mmHg @ 20° C
0 g/L

This section provides selected regulatory information on this product including its components. This is not intended to include all regulations. It is the responsibility of the user to know and comply with all applicable rules, regulations and laws relating to the product being used.

16. OTHER INFORMATION

16.1 ADDITIONAL INFORMATION

ADDITIONAL INFORMATION: Additional product safety information on this product may be obtained by calling Dow's Customer Information Group at 1-800-258-2436 (U.S.) or 1-800-331-6451 (Canada).

16.2 HAZARD RATING SYSTEM

NFPA ratings for this product are: H - 3 F - 1 R - 0

These ratings are part of a specific hazard communication program and should be disregarded where individuals are not trained in the use of this hazard rating system. You should be familiar with the hazard communication programs applicable to your workplace.

16.3 RECOMMENDED USES AND RESTRICTIONS

MATERIAL SAFETY DATA SHEET

Product Name: TRITON(TM) X-100 SURFACTANT
MSDS#: 2207

Effective Date: 2001.09.18
Page 15 of 15

NOTICE! NOT TO BE USED AS A BIOCIDES IN INTRAVAGINAL END-USE APPLICATIONS (INCLUDING SPERMICIDES). FOR INDUSTRY USE ONLY.
Cleaning agent

FOR INDUSTRY USE ONLY

16.4 REVISION

Version: 6.

Revision: 2001.09.18

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

16.5 LEGEND

Bacterial/NA	Non Acclimated Bacteria
F	Fire
H	Health
N/A	Not available
NFPA	National Fire Protection Association
O	Oxidizer
R	Reactivity
TS	Trade secret.
VOL/VOL	Volume/Volume
W	Water Reactive
W/W	Weight/Weight

NOTICE: Dow urges each customer or recipient of this MSDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this MSDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given., Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that its activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of Dow, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product., Due to the proliferation of sources for information such as manufacturer-specific MSDSs, Dow is not and cannot be responsible for MSDSs obtained from any source other than Dow. If you have obtained a Dow MSDS from a non-Dow source or if you are not sure that a Dow MSDS is current, please contact Dow for the most current version.