



Material Safety Data Sheet

The Dow Chemical Company

Product Name: TRITON(TM) X-100 SURFACTANT..

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The Dow Chemical Company encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. Product and Company Identification

Product Name

TRITON(TM) X-100 SURFACTANT..

COMPANY IDENTIFICATION

The Dow Chemical Company
2030 Willard H. Dow Center
Midland, MI 48674
USA

Customer Information Number: 800-258-2436

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 989-636-4400

Local Emergency Contact: 989-636-4400

2. Hazards Identification

Emergency Overview

Color: Yellow

Physical State: Liquid.

Odor: Mild

Hazards of product:

DANGER! Causes severe eye burns. May cause skin irritation. May be harmful if swallowed. Evacuate area. Keep upwind of spill. Slipping hazard.

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential Health Effects

Eye Contact: May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Mist may cause eye irritation.

Skin Contact: Brief contact is essentially nonirritating to skin. Prolonged contact may cause moderate skin irritation with local redness. Repeated contact may cause moderate skin irritation with local redness.

Skin Absorption: Prolonged skin contact is unlikely to result in absorption of harmful amounts.

Inhalation: At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous. Mist may cause irritation of upper respiratory tract (nose and throat).

Ingestion: Low toxicity if swallowed. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury.

Aspiration hazard: Based on physical properties, not likely to be an aspiration hazard.

Birth Defects/Developmental Effects: Has been toxic to the fetus in laboratory animals at doses toxic to the mother. These effects were only observed at exaggerated doses.

3. Composition Information

| Component | CAS # | Amount |
|---------------------------------------|------------|-----------|
| Polyethylene glycol octylphenyl ether | 9036-19-5 | >= 97.0 % |
| Poly(ethylene oxide) | 25322-68-3 | <= 3.0 % |

4. First-aid measures

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin Contact: Wash skin with plenty of water.

Eye Contact: Wash immediately and continuously with flowing water for at least 30 minutes. Remove contact lenses after the first 5 minutes and continue washing. Obtain prompt medical consultation, preferably from an ophthalmologist. Eye wash fountain should be located in immediate work area.

Ingestion: If swallowed, seek medical attention. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), no additional symptoms and effects are anticipated.

Indication of immediate medical attention and special treatment needed

Chemical eye burns may require extended irrigation. Obtain prompt consultation, preferably from an ophthalmologist. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. Fire Fighting Measures

Suitable extinguishing media

Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Do not use direct water stream. May spread fire. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

Special hazards arising from the substance or mixture

Hazardous Combustion Products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Container may rupture from gas generation in a fire situation. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Use water spray to cool fire exposed containers and fire affected zone until fire is out and danger of reignition has passed. Fight fire from protected location or safe distance. Consider the use of unmanned hose holders or monitor nozzles. Immediately withdraw all personnel from the area in case of rising sound from venting safety device or discoloration of the container. Burning liquids may be extinguished by dilution with water. Do not use direct water stream. May spread fire. Move container from fire area if this is possible without hazard. Burning liquids may be moved by flushing with water to protect personnel and minimize property damage.

Special Protective Equipment for Firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures: Evacuate area. Refer to Section 7, Handling, for additional precautionary measures. Only trained and properly protected personnel must be involved in clean-up operations. Keep upwind of spill. Ventilate area of leak or spill. Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Absorb with materials such as: Sand. Dirt. Collect in suitable and properly labeled containers. Do not use water for cleanup. See Section 13, Disposal Considerations, for additional information.

7. Handling and Storage

Handling

General Handling: Do not get in eyes. Avoid contact with skin and clothing. Do not swallow. Wash thoroughly after handling. Avoid breathing vapor. Use with adequate ventilation. Keep container closed. Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Storage

No specific requirements. Additional storage and handling information on this product may be obtained by calling your sales or customer service contact. The shelf life given is for unopened containers stored under moderate temperature conditions.

Shelf life: Use within
24 Months

8. Exposure Controls / Personal Protection

Exposure Limits

| Component | List | Type | Value |
|----------------------|-----------|---------------------|----------|
| Poly(ethylene oxide) | AIHA WEEL | TWA Particulate. | 10 mg/m3 |

Personal Protection

Eye/Face Protection: Use chemical goggles.

Skin Protection: Wear clean, body-covering clothing.

Hand protection: Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. Examples of preferred glove barrier materials include: Butyl rubber. Ethyl vinyl alcohol laminate ("EVAL"). Examples of acceptable glove barrier materials include: Natural rubber ("latex"). Neoprene. Nitrile/butadiene rubber ("nitrile" or "NBR"). Polyvinyl chloride ("PVC" or "vinyl"). Viton. NOTICE: The selection of a specific glove for a particular application and duration of use in a workplace should also take into account all relevant workplace factors such as, but not limited to: Other chemicals which may be handled, physical requirements (cut/puncture protection, dexterity, thermal protection), potential body reactions to glove materials, as well as the instructions/specifications provided by the glove supplier.

Respiratory Protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. In misty atmospheres, use an approved particulate respirator. The following should be effective types of air-purifying respirators: Organic vapor cartridge with a particulate pre-filter.

Ingestion: Use good personal hygiene. Do not consume or store food in the work area. Wash hands before smoking or eating.

Engineering Controls

Ventilation: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

9. Physical and Chemical Properties

Appearance

| | |
|---|--|
| Physical State | Liquid. |
| Color | Yellow |
| Odor | Mild |
| Odor Threshold | No test data available |
| pH | 6 <i>Calculated</i> (5% aqueous solution) |
| Melting Point | Not applicable to liquids |
| Freezing Point | See Pour Point |
| Boiling Point (760 mmHg) | > 200 °C (> 392 °F) <i>Calculated</i> . |
| Flash Point - Closed Cup | 251 °C (484 °F) <i>ASTM D93</i> |
| Flash Point - Open Cup | 290 °C (554 °F) <i>ASTM D92</i> |
| Evaporation Rate (Butyl Acetate = 1) | <0.01 <i>Calculated</i> |
| Flammability (solid, gas) | No |
| Flammable Limits In Air | Lower: No test data available Upper: No test data available |
| Vapor Pressure | < 0.01 mmHg @ 20 °C <i>Calculated</i> |
| Vapor Density (air = 1) | >1 <i>Calculated</i> |
| Specific Gravity (H ₂ O = 1) | 1.061 20 °C/20 °C <i>Calculated</i> |

| | |
|---|--|
| Solubility in water (by weight) | Completely soluble but some compositions may form gels |
| Partition coefficient, n-octanol/water (log Pow) | 2.7 <i>Estimated.</i> |
| Autoignition Temperature | No test data available |
| Decomposition Temperature | No test data available |
| Kinematic Viscosity | 226 cSt <i>Calculated</i> |
| Pour point | 2 °C (36 °F) <i>Calculated</i> |

10. Stability and Reactivity

Reactivity

No dangerous reaction known under conditions of normal use.

Chemical stability

Thermally stable at typical use temperatures.

Possibility of hazardous reactions

Will not occur.

Conditions to Avoid: Do not distill to dryness. Product can oxidize at elevated temperatures. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible Materials: Avoid contact with: Strong acids. Strong oxidizers.

Hazardous decomposition products

Decomposition products depend upon temperature, air supply and the presence of other materials. Decomposition products can include and are not limited to: Aldehydes. Ketones. Organic acids.

11. Toxicological Information

Acute Toxicity

Ingestion

Typical for this family of materials. LD50, Rat 1,900 - 5,000 mg/kg

Dermal

Typical for this family of materials. LD50, Rabbit > 3,000 mg/kg

Inhalation

As product: The LC50 has not been determined.

Eye damage/eye irritation

May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Mist may cause eye irritation.

Skin corrosion/irritation

Brief contact is essentially nonirritating to skin. Prolonged contact may cause moderate skin irritation with local redness. Repeated contact may cause moderate skin irritation with local redness.

Sensitization

Skin

Did not cause allergic skin reactions when tested in humans.

Respiratory

No relevant information found.

Repeated Dose Toxicity

No relevant information found.

Chronic Toxicity and Carcinogenicity

No relevant information found.

Developmental Toxicity

Has been toxic to the fetus in laboratory animals at doses toxic to the mother. These effects were only observed at exaggerated doses. Did not cause birth defects in laboratory animals.

Reproductive Toxicity

No relevant information found.

Genetic Toxicology

No relevant information found.

12. Ecological Information

Toxicity

For this family of materials: Material is moderately toxic to aquatic organisms on an acute basis (LC50/EC50 between 1 and 10 mg/L in the most sensitive species tested).

Fish Acute & Prolonged Toxicity

For this family of materials: LC50, fathead minnow (*Pimephales promelas*), static, 96 h: 4 - 8.9 mg/l

Aquatic Invertebrate Acute Toxicity

For this family of materials: EC50, water flea *Daphnia magna*, 48 h: 18 - 26 mg/l

Toxicity to Micro-organisms

For this family of materials: For this family of materials: IC50; bacteria, 16 h: 5,000 mg/l

Persistence and Degradability

For this family of materials: Material is readily biodegradable. Passes OECD test(s) for ready biodegradability.

OECD Biodegradation Tests: For this family of materials:

| Biodegradation | Exposure Time | Method | 10 Day Window |
|----------------|---------------|----------------|----------------|
| > 60 % | 28 d | OECD 301B Test | Not applicable |

| Biological oxygen demand (BOD): | | | |
|---------------------------------|-----------|-----------|--------|
| BOD 5 | BOD 10 | BOD 20 | BOD 28 |
| 17 - 30 % | 25 - 40 % | 23 - 51 % | |

Chemical Oxygen Demand: 1.71 - 2.18 mg/mg

Theoretical Oxygen Demand: 2.05 - 2.61 mg/mg

Bioaccumulative potential

Partition coefficient, n-octanol/water (log Pow): 2.7 Estimated.

Bioconcentration Factor (BCF): 15; Estimated.

Mobility in soil

Mobility in soil: No relevant data found.

13. Disposal Considerations

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. AS YOUR SUPPLIER, WE HAVE 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: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Incinerator or other thermal destruction device. Waste water treatment system.

14. Transport Information

DOT Non-Bulk
NOT REGULATED

DOT Bulk
NOT REGULATED

IMDG
NOT REGULATED

ICAO/IATA
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.

15. Regulatory Information

OSHA Hazard Communication Standard

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

| | |
|-----------------------------------|-----|
| Immediate (Acute) Health Hazard | Yes |
| Delayed (Chronic) Health Hazard | No |
| Fire Hazard | No |
| Reactive Hazard | No |
| Sudden Release of Pressure Hazard | No |

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Special Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

WARNING: This product contains a chemical(s) known to the State of California to cause cancer.

| Component | CAS # | Amount |
|-------------|----------|-------------|
| 1,4-Dioxane | 123-91-1 | <= 20.0 PPM |

US. Toxic Substances Control Act

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 720.30

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.

European Inventory of Existing Commercial Chemical Substances (EINECS)

This product is a polymer according to the definition in Directive 92/32/EEC (7th Amendment to Directive 67/548/EEC) and all of its starting materials and intentional additives are listed in the European Inventory of Existing Commercial Chemical Substances (EINECS) or in compliance with European (EU) chemical inventory requirements.

16. Other Information

Product Literature

Additional information on this and other products may be obtained by visiting our web page. Additional information on this product may be obtained by calling your sales or customer service contact. Ask for a product brochure.

Hazard Rating System

| NFPA | Health | Fire | Reactivity |
|------|--------|------|------------|
| | 3 | 1 | 0 |

Recommended Uses and Restrictions

Multi-purpose surfactant. We recommend that you use this product in a manner consistent with the listed use. If your intended use is not consistent with the stated use, please contact your sales or technical service representative.

Revision

Identification Number: 2207 / 0000 / Issue Date 11/19/2010 / Version: 5.0

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

Legend

| | |
|--------------|---|
| N/A | Not available |
| W/W | Weight/Weight |
| OEL | Occupational Exposure Limit |
| STEL | Short Term Exposure Limit |
| TWA | Time Weighted Average |
| ACGIH | American Conference of Governmental Industrial Hygienists, Inc. |
| DOW IHG | Dow Industrial Hygiene Guideline |
| WEEL | Workplace Environmental Exposure Level |
| HAZ_DES | Hazard Designation |
| Action Level | A value set by OSHA that is lower than the PEL which will trigger the need for activities such as exposure monitoring and medical surveillance if exceeded. |

The Dow Chemical Company urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS 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 his 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 the manufacturer, 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 (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.