SAFETY DATA SHEET
THE DOW CHEMICAL COMPANY

Product name: STYROFOAM™ SPF CA 2045 Polyol 55gal

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. IDENTIFICATION

Product name: STYROFOAM™ SPF CA 2045 Polyol 55gal

Recommended use of the chemical and restrictions on use
Identified uses: For industrial use. Component(s) for the manufacture of urethane polymers. 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.

COMPANY IDENTIFICATION
THE DOW CHEMICAL COMPANY
2030 WILLARD H DOW CENTER
MIDLAND MI  48674-0000
UNITED STATES

Customer Information Number: 800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER
24-Hour Emergency Contact: 800-424-9300
Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
This material is hazardous under the criteria of the Federal OSHA Hazard Communication Standard 29CFR 1910.1200.
Skin irritation - Category 2
Serious eye damage - Category 1
Reproductive toxicity - Category 2
Specific target organ toxicity - repeated exposure - Category 2 - Oral

Label elements
Hazard pictograms
Signal word: DANGER!

Hazards
Causes skin irritation.
Causes serious eye damage.
Suspected of damaging fertility or the unborn child.
May cause damage to organs (Kidney) through prolonged or repeated exposure if swallowed.

Precautionary statements

Prevention
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Wear eye protection/ face protection.
Wear protective gloves.
Use personal protective equipment as required.

Response
IF ON SKIN: Wash with plenty of soap and water.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor/ physician.
IF exposed or concerned: Get medical advice/ attention.
If skin irritation occurs: Get medical advice/ attention.
Take off contaminated clothing and wash before reuse.

Storage
Store locked up.

Disposal
Dispose of contents/ container to an approved waste disposal plant.

Other hazards
no data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is a mixture.

<table>
<thead>
<tr>
<th>Component</th>
<th>CASRN</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,4-Benzenedicarboxylic Acid, Dimethyl Ester, manuf. of, by-products from, Polymers with</td>
<td>70749-97-2</td>
<td>&gt;= 30.0 - &lt;= 60.0 %</td>
</tr>
</tbody>
</table>
Diethylene Glycol

<table>
<thead>
<tr>
<th>Chemical Description</th>
<th>CAS Number</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phenol, polymer with formaldehyde, propylene oxide, and ethylene oxide</td>
<td>25134-86-5</td>
<td>&gt;= 10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>1,1,1,3,3 - Pentafluoropropane</td>
<td>460-73-1</td>
<td>&gt;= 10.0 - &lt;= 30.0 %</td>
</tr>
<tr>
<td>Triethyl phosphate</td>
<td>78-40-0</td>
<td>&gt;= 5.0 - &lt;= 10.0 %</td>
</tr>
<tr>
<td>Diethylene glycol</td>
<td>111-46-6</td>
<td>&gt;= 5.0 - &lt;= 10.0 %</td>
</tr>
<tr>
<td>2-(2-Hydroxyethoxy)ethyl-2-hydroxypropyl-3,4,5,6-tetrabromo phthalate</td>
<td>20566-35-2</td>
<td>&gt;= 3.0 - &lt;= 7.0 %</td>
</tr>
<tr>
<td>Nonylphenol diethanolamine Mannich base, propylene oxide, ethylene oxide polymer</td>
<td>52019-35-9</td>
<td>&gt;= 1.0 - &lt;= 5.0 %</td>
</tr>
<tr>
<td>N,N-Dimethylcyclohexylamine</td>
<td>98-94-2</td>
<td>&gt;= 1.0 - &lt;= 5.0 %</td>
</tr>
<tr>
<td>Tris(dimethylamino)propyl amine</td>
<td>33329-35-0</td>
<td>&gt;= 1.0 - &lt;= 5.0 %</td>
</tr>
</tbody>
</table>

### 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 not breathing, give artificial respiration; if by mouth to mouth use rescuer protection (pocket mask, etc). If breathing is difficult, oxygen should be administered by qualified personnel. Call a physician or transport to a medical facility.

**Skin contact:** Immediately flush skin with water while removing contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated leather items such as shoes, belts, and watchbands. Suitable emergency safety shower facility should be immediately available.

**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. Suitable emergency eye wash facility should be immediately available.

**Ingestion:** Do not induce vomiting. Seek medical attention immediately. If person is fully conscious give 1 cup or 8 ounces (240 ml) of water. If medical advice is delayed and if an adult has swallowed several ounces of chemical, then give 3-4 ounces (1/3-1/2 Cup) (90-120 ml) of hard liquor such as 80 proof whiskey. For children, give proportionally less liquor at a dose of 0.3 ounce (1 1/2 tsp.) (8 ml) liquor for each 10 pounds of body weight, or 2 ml per kg body weight [e.g., 1.2 ounce (2 1/3 tbsp.) for a 40 pound child or 36 ml for an 18 kg child].

**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), any additional important symptoms and effects are described in Section 11: Toxicology Information.

**Indication of any immediate medical attention and special treatment needed**

**Notes to physician:** Due to structural analogy and clinical data, this material may have a mechanism of intoxication similar to ethylene glycol. On that basis, treatment similar to ethylene glycol intoxication may be of benefit. In cases where several ounces (60 - 100 ml) have been ingested, consider the use of ethanol and hemodialysis in the treatment. Consult standard literature for details of treatment. If ethanol is used, a therapeutically effective blood concentration in the range of 100 - 150 mg/dl may be achieved by a rapid loading dose followed by a continuous intravenous infusion. Consult standard literature for details of treatment. 4-Methyl pyrazole (Antizol®) is an effective blocker of alcohol dehydrogenase and should be used in the treatment of ethylene glycol (EG), di- or triethylene glycol (DEG, TEG), ethylene glycol butyl ether (EGBE), or methanol intoxication if available. Fomepizole protocol (Brent, J. et al., New England Journal of Medicine, Feb. 8, 2001, 344:6, p. 424-9): loading dose 15 mg/kg intravenously, follow by bolus dose of 10 mg/kg every 12 hours; after 48 hours, increase bolus dose to 15 mg/kg every 12 hours. Continue fomepizole until serum methanol, EG, DEG, TEG or EGBE are undetectable. The signs and symptoms of poisoning include anion gap metabolic acidosis, CNS depression, renal tubular injury, and possible late stage cranial nerve involvement. Respiratory symptoms, including pulmonary edema, may be delayed. Persons receiving significant exposure should be observed 24-48 hours for signs of respiratory distress. In severe poisoning, respiratory support with mechanical ventilation and positive expiratory pressure may be required. Maintain adequate ventilation and oxygenation of the patient. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. If burn is present, treat as any thermal burn, after decontamination. Exposure may increase "myocardial irritability". Do not administer sympathomimetic drugs such as epinephrine unless absolutely necessary. Exposure to amine vapors may cause minor transient edema of the corneal epithelium (glauopsia) with blurred vision, blue haze and halos around bright objects. Effects disappear in a few hours and temporarily reduce ability to drive vehicles. Cholinesterase inhibition has been noted in human exposure but is not of benefit in determining exposure and is not correlated with signs of exposure. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

### 5. FIREFIGHTING MEASURES

**Suitable extinguishing media:** Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam. Alcohol resistant foams (ATC type) are preferred. General purpose synthetic foams (including AFFF) or protein foams may function, but will be less effective.

**Unsuitable extinguishing media:** Do not use direct water stream. May spread fire.

**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. Hydrogen halides.

**Unusual Fire and Explosion Hazards:** Container may rupture from gas generation in a fire situation. Blowing agent vaporizes quickly at room temperature. 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. 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. Contain fire water run-off if possible. Fire water run-off, if not contained, may cause environmental damage. Review the "Accidental Release Measures" and the "Ecological Information" sections of this (M)SDS.

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). Avoid contact with this material during fire fighting operations. If contact is likely, change to full chemical resistant fire fighting clothing with self-contained breathing apparatus. If this is not available, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Keep personnel out of confined or poorly ventilated areas. Refer to section 7, Handling, for additional precautionary measures. Keep unnecessary and unprotected personnel from entering the area. Keep upwind of spill. Spilled material may cause a slipping hazard. Ventilate area of leak or spill. Confined space entry procedures must be followed before entering the area. 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: Dirt. Sand. Sawdust. Collect in suitable and properly labeled containers. Wash the spill site with water. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Avoid contact with eyes, skin, and clothing. Avoid prolonged or repeated contact with skin. Wash thoroughly after handling. Do not swallow. Avoid breathing vapor. Use with adequate ventilation. Keep container closed. Do not enter confined spaces unless adequately ventilated. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Spills of these organic materials on hot fibrous insulations may lead to lowering of the autoignition temperatures possibly resulting in spontaneous combustion.


Storage stability

Storage temperature: Storage Period:
8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters
Exposure limits are listed below, if they exist.

<table>
<thead>
<tr>
<th>Component</th>
<th>Regulation</th>
<th>Type of listing</th>
<th>Value/Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,1,1,3,3 - Pentafluoropropane</td>
<td>US WEEL</td>
<td>TWA</td>
<td>300 ppm</td>
</tr>
<tr>
<td>Triethyl phosphate</td>
<td>US WEEL</td>
<td>TWA</td>
<td>7.45 mg/m³</td>
</tr>
<tr>
<td>Diethylene glycol</td>
<td>US WEEL</td>
<td>TWA</td>
<td>10 mg/m³</td>
</tr>
<tr>
<td>N,N- Dimethylcyclohexylamine</td>
<td>Dow IHG</td>
<td>TWA</td>
<td>1 ppm</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Absorbed via skin</td>
</tr>
</tbody>
</table>

Exposure controls

**Engineering controls:** Use engineering controls to maintain airborne level below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, use only in enclosed systems or with local exhaust ventilation. Exhaust systems should be designed to move the air away from the source of vapor/aerosol generation and people working at this point. Lethal concentrations may exist in areas with poor ventilation.

**Individual protection measures**

**Eye/face protection:** Use chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

**Hand protection:** Use gloves chemically resistant to this material when prolonged or frequently repeated contact could occur. If hands are cut or scratched, use gloves chemically resistant to this material even for brief exposures. Use gloves with insulation for thermal protection, when needed. Examples of preferred glove barrier materials include: Chlorinated polyethylene. Polyethylene. Ethyl vinyl alcohol laminate ("EVAL"). Polyvinyl alcohol ("PVA"). Styrene/butadiene rubber. Viton. Examples of acceptable glove barrier materials include: Butyl rubber. Natural rubber ("latex"). Polyvinyl chloride ("PVC" or "vinyl"). 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.

**Other protection:** When prolonged or frequently repeated contact could occur, use protective clothing chemically resistant to this material. Selection of specific items such as faceshield, boots, apron, or full-body suit will depend on the task. When handling hot material, protect skin from thermal burns as well as from skin absorption.

**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, use an approved respirator. When respiratory protection is required, use an approved positive-pressure self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. For emergency conditions, use an approved positive-pressure self-contained breathing apparatus. In confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive pressure air line with auxiliary self-contained air supply.
9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance
  Physical state: Liquid.
  Color: Blue
  Odor: Amine.

Odor Threshold: No test data available
pH: No test data available
Melting point/range: Not applicable to liquids
Freezing point: No test data available
Boiling point (760 mmHg): No test data available
Flash point: closed cup 100 °C (212 °F) Calculated.
Evaporation Rate (Butyl Acetate = 1): No test data available
Flammability (solid, gas): Not applicable to liquids
Lower explosion limit: No test data available
Upper explosion limit: No test data available
Vapor Pressure: 12 lb/in2 at 32 °C (90 °F) Estimated.
Relative Vapor Density (air = 1): No test data available
Relative Density (water = 1): 1.206 ASTM D891
Water solubility: No test data available
Partition coefficient: n-octanol/water: no data available
Auto-ignition temperature: No test data available
Decomposition temperature: No test data available
Kinematic Viscosity: 375 cSt at 25 °C (77 °F) ASTM D4878
Explosive properties: Not explosive
Oxidizing properties: No
Molecular weight: no data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: no data available

Chemical stability: Stable under recommended storage conditions. See Storage, Section 7.

Possibility of hazardous reactions: Will not occur by itself.
Conditions to avoid: Product can oxidize at elevated temperatures. Elevated temperatures can cause pressure buildup in closed containers due to the release of blowing agents. Generation of gas during decomposition can cause pressure in closed systems.

Incompatible materials: Avoid contact with oxidizing materials. Avoid contact with: Strong acids. Strong bases. Avoid unintended contact with isocyanates. The reaction of polyols and isocyanates generates heat.

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: Carbon dioxide. Alcohols. Ethers. Hydrocarbons. Hydrogen halides. Ketones. Polymer fragments.

11. TOXICOLOGICAL INFORMATION

Toxicological information on this product or its components appear in this section when such data is available.

Acute toxicity

Acute oral toxicity
Ingestion of quantities (approximately 65 mL (2 oz.) for diethylene glycol or 100 mL (3 oz.) for ethylene glycol) has caused death in humans. Small amounts swallowed incidentally as a result of normal handling operations are not likely to cause injury; however, swallowing larger amounts may cause injury. The data presented are for the following material: Diethylene glycol. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. As product: Single dose oral LD50 has not been determined.

Acute dermal toxicity
Prolonged skin contact is unlikely to result in absorption of harmful amounts. Massive contact with damaged skin or of material sufficiently hot to burn skin may result in absorption of potentially lethal amounts.

As product: The dermal LD50 has not been determined. LD50, Rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity
Prolonged excessive exposure may cause adverse effects. In confined or poorly ventilated areas, vapor can easily accumulate and can cause unconsciousness and death due to displacement of oxygen. May cause respiratory irritation and central nervous system depression. Symptoms may include headache, dizziness and drowsiness, progressing to incoordination and unconsciousness. Symptoms of excessive exposure may be anesthetic or narcotic effects; dizziness and drowsiness may be observed. Excessive exposure may increase sensitivity to epinephrine and increase myocardial irritability (irregular heartbeats). As product: The LC50 has not been determined.

Skin corrosion/irritation
Prolonged contact may cause skin irritation with local redness.

Serious 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. Vapor of amines may cause swelling of the cornea resulting in visual disturbances such as blurred or hazy vision. Bright lights may appear to be surrounded by halos. Effects may be delayed and typically disappear spontaneously.

Sensitization
For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)
Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)
Contains a component which is reported to be a weak organophosphate-type cholinesterase inhibitor. Excessive exposure may produce organophosphate type cholinesterase inhibition. Signs and symptoms of excessive exposure may be headache, dizziness, incoordination, muscle twitching, tremors, nausea, abdominal cramps, diarrhea, sweating, pinpoint pupils, blurred vision, salivation, tearing, tightness in chest, excessive urination, convulsions. Contains component(s) which have been reported to cause effects on the following organs in humans: Kidney. Contains component(s) which have been reported to cause effects on the following organs in animals: Liver. Respiratory tract. Heart.

Carcinogenicity
Diethylene glycol has been tested for carcinogenicity in animal studies and is not believed to pose a carcinogenic risk to man.

Teratogenicity
Diethylene glycol has caused toxicity to the fetus and some birth defects at maternally toxic, high doses in animals. Other animal studies have not reproduced birth defects even at much higher doses that caused severe maternal toxicity.

Reproductive toxicity
Diethylene glycol did not interfere with reproduction in animal studies except at very high doses.

Mutagenicity
Genetic toxicity studies on tested components were predominantly negative. Contains component(s) which were negative in some animal genetic toxicity studies and positive in others.

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

COMPONENTS INFLUENCING TOXICOLOGY:

1,4-Benzenedicarboxylic Acid, Dimethyl Ester, manuf. of, by-products from, Polymers with Diethylene Glycol

Acute oral toxicity
Typical for this family of materials. LD50, Rat, > 10,000 mg/kg
Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous.

As product: The LC50 has not been determined.

Phenol, polymer with formaldehyde, propylene oxide and ethylene oxide

Acute oral toxicity
LD50, Rat, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous. For respiratory irritation and narcotic effects: No relevant data found.

The LC50 has not been determined.

1,1,1,3,3-Pentafluoropropane

Acute oral toxicity
Single dose oral LD50 has not been determined.

Acute inhalation toxicity
LC50, Rat, 4 Hour, vapour, 1,096 mg/l

Triethyl phosphate

Acute oral toxicity
LD50, Rat, 1,131 mg/kg

Acute inhalation toxicity
LC50, Rat, 4 Hour, dust/mist, > 2.35 mg/l No deaths occurred at this concentration.

Diethylene glycol

Acute oral toxicity
Oral toxicity is expected to be moderate in humans due to ethylene glycol even though tests with animals show a lower degree of toxicity. Ingestion of quantities (approximately 65 mL (2 oz.) for diethylene glycol or 100 mL (3 oz.) for ethylene glycol) has caused death in humans. May cause nausea and vomiting. May cause abdominal discomfort or diarrhea. Excessive exposure may cause central nervous system effects, cardiopulmonary effects (metabolic acidosis), and kidney failure. LD50, Rat, male, 19,600 mg/kg

Lethal Dose, Human, adult, 2 Ounces Estimated.

Acute inhalation toxicity
LC50, Rat, 4 Hour, dust/mist, > 4.6 mg/l The LC50 value is greater than the Maximum Attainable Concentration. No deaths occurred at this concentration.

2-(2-Hydroxyethoxy)ethyl-2-hydroxypropyl-3,4,5,6-tetrabromo phthalate

Acute oral toxicity
LD50, Rat, female, > 2,000 mg/kg No deaths occurred at this concentration.

Acute inhalation toxicity
LC50, 1 Hour, vapour, > 0.008 mg/l Other guidelines The LC50 value is greater than the Maximum Attainable Concentration. No deaths occurred following exposure to a saturated atmosphere.
Nonylphenol diethanolamine Mannich base, propylene oxide, ethylene oxide polymer

**Acute oral toxicity**
LD50, Rat, 1,370 mg/kg

**Acute inhalation toxicity**
At room temperature, exposure to vapor is minimal due to low volatility; single exposure is not likely to be hazardous. Vapor from heated material may cause respiratory irritation.

As product: The LC50 has not been determined.

N,N-Dimethylcyclohexylamine

**Acute oral toxicity**
LD50, Rat, 272 mg/kg

**Acute inhalation toxicity**
LC50, Rat, 6 Hour, vapour, > 1.7 - 5.8 mg/l  OECD Test Guideline 403

Tris(dimethylamino)propyl amine

**Acute oral toxicity**
LD50, Rat, 2,350 mg/kg

**Acute inhalation toxicity**
LC50, Rat, 4 Hour, 6.9 mg/l

### 12. ECOLOGICAL INFORMATION

Ecotoxicological information on this product or its components appear in this section when such data is available.

**Toxicity**

1,4-Benzenedicarboxylic Acid, Dimethyl Ester, manuf. of, by-products from, Polymers with Diethylene Glycol

**Acute toxicity to fish**
For similar material(s):
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

Phenol, polymer with formaldehyde, propylene oxide and ethylene oxide

**Acute toxicity to fish**
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).
LC50, Danio rerio (zebra fish), static test, 96 Hour, 57.1 mg/l, OECD Test Guideline 203 or Equivalent

**Toxicity to bacteria**
EC50, activated sludge, Respiration inhibition, 30 min, > 200 mg/l, OECD 209 Test

1,1,1,3,3 - Pentfluoropropane

**Acute toxicity to fish**
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Oncorhynchus mykiss (rainbow trout), semi-static test, 96 Hour, > 100 mg/l

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), static test, 48 Hour, > 100 mg/l

**Acute toxicity to algae/aquatic plants**
ErC50, Selenastrum capricornutum (green algae), static test, 72 Hour, Growth rate, > 118 mg/l

**Chronic toxicity to aquatic invertebrates**
NOEC, Daphnia magna (Water flea), semi-static test, 14 d, mortality, 29 mg/l

**Triethyl phosphate**

**Acute toxicity to fish**
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Leuciscus idus (Golden orfe), static test, 48 Hour, 2,140 mg/l, OECD Test Guideline 203 or Equivalent

**Acute toxicity to aquatic invertebrates**
EC50, Daphnia magna (Water flea), static test, 48 Hour, ≥ 350 mg/l, OECD Test Guideline 202 or Equivalent

**Acute toxicity to algae/aquatic plants**
EC50, Desmodesmus subspicatus (green algae), 72 Hour, Growth rate inhibition, 900 mg/l, OECD Test Guideline 201

**Toxicity to bacteria**
EC50, activated sludge, Respiration inhibition, 30 min, > 2,985 mg/l, OECD 209 Test

**Diethylene glycol**

**Acute toxicity to fish**
Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).

LC50, Pimephales promelas (fathead minnow), flow-through test, 96 Hour, 75,200 mg/l, OECD Test Guideline 203 or Equivalent

**Toxicity to bacteria**
EC50, activated sludge, 3 Hour, > 1,000 mg/l, OECD 209 Test

**2-(2-Hydroxyethoxy)ethyl-2-hydroxypropyl-3,4,5,6-tetrabromo phthalate**

**Acute toxicity to fish**
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).

Toxicity to aquatic species occurs at concentrations above material's water solubility.

LC50, Lepomis macrochirus (Bluegill sunfish), 96 Hour, 12 mg/l, OECD Test Guideline 203 or Equivalent

**Nonylphenol diethanolamine Mannich base, propylene oxide, ethylene oxide polymer**

**Acute toxicity to fish**
Based on information for a similar material:
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).
N,N-Dimethylcyclohexylamine
Acute toxicity to fish
Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested).
May increase pH of aquatic systems to > pH 10 which may be toxic to aquatic organisms. LC50, Oncorhynchus mykiss (rainbow trout), static test, 96 Hour, 28.1 mg/l, OECD Test Guideline 203 or Equivalent

Acute toxicity to aquatic invertebrates
LC50, Daphnia magna (Water flea), static test, 48 Hour, 75 mg/l, OECD Test Guideline 202 or Equivalent

Acute toxicity to algae/aquatic plants
NOEC, Desmodesmus subspicatus (Scenedesmus subspicatus), 72 Hour, Growth rate, 0.0625 mg/l, OECD Test Guideline 201

Toxicity to bacteria
EC50, Bacteria, 17 Hour, Growth inhibition, 206 mg/l, DIN 38412

Tris(dimethylamino)propyl amine
Acute toxicity to fish
Material is practically non-toxic to fish on an acute basis (LC50 > 100 mg/L).
LC50, Oryzias latipes (Orange-red killifish), static test, 48 Hour, 430 mg/l, OECD Test Guideline 203 or Equivalent

Persistence and degradability

1,4-Benzenedicarboxylic Acid, Dimethyl Ester, manuf. of, by-products from, Polymers with Diethylene Glycol
Biodegradability: No relevant data found.

Phenol, polymer with formaldehyde, propylene oxide and ethylene oxide
Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. 10-day Window: Fail
Biodegradation: 16 %
Exposure time: 28 d
Method: OECD Test Guideline 301B or Equivalent

1,1,1,3,3 - Pentfluoropropane
Biodegradability: Material is expected to biodegrade very slowly (in the environment). Fails to pass OECD/EEC tests for ready biodegradability. 10-day Window: Fail
Biodegradation: 8 %
Exposure time: 28 d
Method: OECD Test Guideline 301D or Equivalent

Theoretical Oxygen Demand: 0.60 mg/mg

Photodegradation
Test Type: Half-life (indirect photolysis)
Sensitizer: OH radicals
Atmospheric half-life: 360 d
Method: Estimated.

**Triethyl phosphate**

**Biodegradability:** Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

10-day Window: Not applicable

**Biodegradation:** > 90 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 302B or Equivalent

**Theoretical Oxygen Demand:** 1.58 mg/mg

**Diethylene glycol**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

10-day Window: Pass

**Biodegradation:** 90 - 100 %

**Exposure time:** 20 d

**Method:** OECD Test Guideline 301A or Equivalent

10-day Window: Not applicable

**Biodegradation:** 82 - 98 %

**Exposure time:** 28 d

**Method:** OECD Test Guideline 302C or Equivalent

**Theoretical Oxygen Demand:** 1.51 mg/mg Estimated.

**2-(2-Hydroxyethoxy)ethyl-2-hydroxypropyl-3,4,5,6-tetrabromo phthalate**

**Biodegradability:** Expected to degrade slowly in the environment.

**Theoretical Oxygen Demand:** 0.74 mg/mg

**Photodegradation**

**Test Type:** Half-life (indirect photolysis)

**Sensitizer:** OH radicals

**Atmospheric half-life:** 0.351 d

**Method:** Estimated.

**Nonylphenol diethanolamine Mannich base, propylene oxide, ethylene oxide polymer**

**Biodegradability:** Most polyols are expected to degrade only slowly in the environment.

**N,N-Dimethylcyclohexylamine**

**Biodegradability:** Material is readily biodegradable. Passes OECD test(s) for ready biodegradability. Material is ultimately biodegradable (reaches > 70% mineralization in OECD test(s) for inherent biodegradability).

10-day Window: Pass

**Biodegradation:** 90 - 100 %

**Exposure time:** 18 d

**Method:** OECD Test Guideline 301A or Equivalent

10-day Window: Not applicable

**Biodegradation:** 88 %

**Exposure time:** 24 d

**Method:** OECD Test Guideline 302B or Equivalent
Theoretical Oxygen Demand: 3.40 mg/mg

**Tris(dimethylamino)propyl amine**

Biodegradability: Material is not readily biodegradable according to OECD/EEC guidelines.

Theoretical Oxygen Demand: 3.41 mg/mg

Photodegradation

Test Type: Half-life (indirect photolysis)

Sensitizer: OH radicals

Atmospheric half-life: 0.031 d

Method: Estimated.

**Bioaccumulative potential**

1,4-Benzenedicarboxylic Acid, Dimethyl Ester, manuf. of, by-products from, Polymers with Diethylene Glycol

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

**Phenol, polymer with formaldehyde, propylene oxide and ethylene oxide**

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

**1,1,1,3,3-Pentafluoropropane**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 1.35 Measured

**Triethyl phosphate**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 0.80 Measured

**Diethylene glycol**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): -1.98 at 20 °C Estimated.

Bioconcentration factor (BCF): 100 Fish. Measured

**2-(2-Hydroxyethoxy)ethyl-2-hydroxypropyl-3,4,5,6-tetrabromo phthalate**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).


Bioconcentration factor (BCF): 39 Fish. Estimated.

**Nonylphenol diethanolamine Mannich base, propylene oxide, ethylene oxide polymer**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 0.2 Measured

**N,N-Dimethylcyclohexylamine**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 2.31 Estimated.

**Tris(dimethylamino)propyl amine**

Bioaccumulation: Bioconcentration potential is low (BCF < 100 or Log Pow < 3).

Partition coefficient: n-octanol/water(log Pow): 0.6 Estimated.
Mobility in soil

1,4-Benzenedicarboxylic Acid, Dimethyl Ester, manuf. of, by-products from, Polymers with Diethylene Glycol
No data available.

Phenol, polymer with formaldehyde , propylene oxide and ethylene oxide
No relevant data found.

1,1,1,3,3-Pentafluoropropane
Potential for mobility in soil is medium (Koc between 150 and 500).
Partition coefficient (Koc): 280 Estimated.

Triethyl phosphate
Potential for mobility in soil is very high (Koc between 0 and 50).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient (Koc): 48 Estimated.

Diethylene glycol
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Potential for mobility in soil is very high (Koc between 0 and 50).
Partition coefficient (Koc): < 1 Estimated.

2-(2-Hydroxyethoxy)ethyl-2-hydroxypropyl-3,4,5,6-tetrabromo phthalate
Potential for mobility in soil is very high (Koc between 0 and 50).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient (Koc): 10 Estimated.

Nonylphenol diethanolamine Mannich base, propylene oxide, ethylene oxide polymer
Expected to be relatively immobile in soil (Koc > 5000).

N,N-Dimethyloclohexylamine
Potential for mobility in soil is high (Koc between 50 and 150).
Partition coefficient (Koc): 70 Estimated.

Tris(dimethylamino)propyl amine
Expected to be relatively immobile in soil (Koc > 5000).
Given its very low Henry's constant, volatilization from natural bodies of water or moist soil is not expected to be an important fate process.
Partition coefficient (Koc): > 5000 Estimated.

13. DISPOSAL CONSIDERATIONS

Disposal methods: 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: Recycler. Reclaimer. Incinerator or other thermal destruction device. For additional information, refer to: Handling & Storage Information, MSDS Section 7 Stability & Reactivity Information, MSDS Section10 Regulatory Information, MSDS Section 15

14. TRANSPORT INFORMATION

DOT
Not regulated for transport

Classification for SEA transport (IMO-IMDG):
Not regulated for transport
Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code
Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):
Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. 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
Acute Health Hazard
Chronic Health Hazard

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313
This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.
Pennsylvania Worker and Community Right-To-Know Act:
The following chemicals are listed because of the additional requirements of Pennsylvania law:

<table>
<thead>
<tr>
<th>Components</th>
<th>CASRN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diethylene glycol</td>
<td>111-46-6</td>
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</table>

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.

<table>
<thead>
<tr>
<th>Components</th>
<th>CASRN</th>
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</thead>
<tbody>
<tr>
<td>alpha-Methylstyrene</td>
<td>98-83-9</td>
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</table>

United States TSCA Inventory (TSCA)
All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Product Literature
Additional information on this product may be obtained by calling your sales or customer service contact.

Revision
Identification Number: 101215365 / A001 / Issue Date: 04/13/2015 / Version: 5.0
Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Legend

<table>
<thead>
<tr>
<th>Absorbed via skin</th>
<th>Absorbed via skin</th>
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<tr>
<td>Dow IHG</td>
<td>Dow Industrial Hygiene Guideline</td>
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<tr>
<td>TWA</td>
<td>8-hr TWA</td>
</tr>
<tr>
<td>US WEEL</td>
<td>USA. Workplace Environmental Exposure Levels (WEEL)</td>
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</tbody>
</table>

Information Source and References
This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

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-
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