Material Safety Data Sheet
DIMETHYL SULFOXIDE

SECTION 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: ..... DIMETHYL SULFOXIDE
Purity: 99.90%MIN
SYNONYMS: ..... METHANE, SULFINYLBIS- (9CI); DMSO
FORMULA: ..... C_2H_6OS
CAS NUMBER: 67-68-5

SECTION 2 - COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER
Dimethyl Sulfoxide	67-68-5

SECTION 3 - HAZARD IDENTIFICATION

EMERGENCY OVERVIEW:
..... Colorless liquid with mild garlic odor.
..... Irritant.
..... Hygroscopic – moisture sensitive.
..... Possible sensitizer by inhalation and skin contact.
..... Readily absorbed through skin.

PHYSICAL HAZARDS: Hygroscopic – moisture sensitive.

POTENTIAL HEALTH EFFECTS:
..... Inhalation: May be harmful by inhalation. Vapor or mist is irritating to the mucous membranes and upper respiratory tract. Can produce delayed pulmonary edema. May cause nausea, vomiting, headache and dizziness.
..... Eye Contact: Vapor or mist causes eye irritation. May cause blurred vision.
..... Skin Contact: May be harmful by skin absorption. Vapor or mist causes skin irritation. Readily absorbed through skin. May cause allergic reactions, sensitivity to light, nausea, vomiting, diarrhea, chest pain, headache, drowsiness, visual disturbances, blood disorders, burning pain and redness.
..... Ingestion: May be harmful by ingestion. Ingestion may cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause garlic smell on the breath and body. May cause stomach pain and drowsiness.

Overview: May be harmful by inhalation, ingestion, or skin absorption. Vapor or mist is irritating to eyes, skin, mucous membranes and upper respiratory tract. Irritant. Inhalation can produce delayed pulmonary edema. May cause nausea, vomiting, headache and dizziness. May cause blurred vision. Readily absorbed through skin. May cause allergic reactions, sensitivity to light, nausea, vomiting, diarrhea, chest pain, headache, drowsiness, visual disturbances, blood disorders, burning pain and redness. Ingestion may cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause garlic smell on the breath and body. May cause stomach pain and drowsiness. Prolonged or repeated skin contact may cause dermatitis. May

cause liver and kidney damage. Effects may be delayed. Avoid contact with Dimethyl Sulfoxide (DMSO) solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body. Hygroscopic – moisture sensitive. Possible sensitizer by inhalation and skin contact.

SECTION 4 - FIRST AID MEASURES

INHALATION: Remove to fresh air. If breathing has stopped give artificial respiration. If breathing is difficult give oxygen. Call a physician.

EYES CONTACT: Immediately flush eyes with copious amounts of water for at least 15 minutes. Assure adequate flushing by separating eyelids with fingers. Call a physician.

SKIN CONTACT: Immediately wash skin with soap and copious amounts of water while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. Call a physician.

INGESTION: DO NOT INDUCE VOMITING. Wash mouth out with water and call a physician. Never give anything by mouth to an unconscious person.

SECTION 5 - FIRE - FIGHTING MEASURES

EXTINGUISHING MEDIA:	Water Spray. Carbon dioxide, dry chemical powder, or appropriate foam.
SPECIAL FIRE FIGHTING PROCEDURES:	Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes.
UNUSUAL FIRE/EXPLOSION HAZARDS:	Emits toxic fumes of carbon monoxide, carbon dioxide and sulfur oxides under fire conditions. Degrades giving off formaldehyde, methyl mercaptan and sulfur dioxide.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

SPILLS OR LEAKS:

..... Wear self-contained breathing apparatus, rubber boots and heavy rubber gloves.
..... Absorb on sand or vermiculite and place in closed containers for disposal.
..... Ventilate area and wash spill site after material pickup is complete.

SECTION 7 - HANDLING AND STORAGE

Safety shower and eye bath. Mechanical exhaust required. Do not breathe vapor. Avoid contact with eyes, skin and clothing. Avoid prolonged or repeated exposure. Irritant. Possible sensitizer by inhalation and skin contact. Readily absorbed through skin. Wash thoroughly after handling. Hygroscopic – moisture sensitive. Keep containers tightly closed. Store in a cool dry place. Avoid contact with Dimethyl Sulfoxide (DMSO) solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through

skin and may carry such materials into the body. Avoid contaminating sewers and waterways with this material.

SECTION 8 -EXPOSURE CONTROLS & PERSONAL PROTECTION

RESPIRATORY PROTECTION: NIOSH/MSHA-approved respirator.

PROTECTIVE CLOTHING: Compatible chemical-resistant gloves, chemical safety goggles, and other protective clothing.

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless liquid with mild garlic odor.
MOLECULAR WEIGHT: 78.12
BOILING POINT: 189°C(Decomposes).
MELTING POINT: 18.4°C
VAPOR PRESSURE: 0.42mmHg@20°C
VAPOR DENSITY (AIR=1): 2.7g/L
SPECIFIC GRAVITY: 1.101
SOLUBILITY IN WATER: Miscible.
REACTIVITY IN WATER: No information.
FLASHPOINT: 300°F // open cup.
FLAMMABLE LIMITS: **LEL** 2.6% **UEL** 42%
AUTOIGNITION TEMPERATURE: 300°C(573°F)

SECTION 10 - STABILITY AND REACTIVITY DATA

STABILITY: Stable.

INCOMPATIBILITY: Acid chlorides, phosphorus halides, strong acids, strong oxidizing agents and strong reducing agents. Protect from moisture.

HAZARDOUS DECOMPOSITION: Toxic fumes of carbon monoxide, carbon dioxide and sulfur oxides.

Note: Dimethyl Sulfoxide (DMSO) undergoes a violent exothermic reaction on mixing with copper wool and trichloroacetic acid. On mixing with potassium permanganate it will flash instantaneously. It reacts violently with: Acid halides, cyanuric chloride, silicon tetrachloride, phosphorus trichloride and trioxide, thionyl chloride, magnesium perchlorate, silver fluoride, methyl bromide, iodine pentafluoride, nitrogen periodate, diborane, sodium hydride, perchloric and periodic acids. When heated above its boiling point, DMSO degrades giving off formaldehyde, methyl mercaptan and sulfur dioxide.

SECTION 11 - TOXICOLOGICAL INFORMATION

ACUTE EFFECTS:

..... Inhalation: May be harmful by inhalation. Vapor or mist is irritating to the mucous membranes and upper respiratory tract. Can produce delayed pulmonary edema. May cause nausea, vomiting, headache and dizziness.

..... Eye Contact: Vapor or mist causes eye irritation. May cause blurred vision.

..... Skin Contact: May be harmful by skin absorption. Vapor or mist causes skin irritation. Readily absorbed through skin. May cause allergic reactions, sensitivity to light, nausea, vomiting, diarrhea, chest pain, headache, drowsiness, visual disturbances, blood disorders, burning pain and redness.

..... Ingestion: May be harmful by ingestion. Ingestion may cause gastrointestinal irritation with nausea, vomiting and diarrhea. May cause liver and kidney damage. May cause garlic smell on the breath and body. May cause stomach pain and drowsiness.

Avoid contact with Dimethyl Sulfoxide (DMSO) solutions containing toxic materials or materials with unknown toxicological properties. DMSO is readily absorbed through skin and may carry such materials into the body. Effects may be delayed.

CHRONIC EFFECTS:

..... Toxicity: LC_{50} (inh, rat): No information.
LD_{50} (oral, rat): 14500 mg/kg.
Irritation (skn, rbt): 10 MG/24H OPEN MLD
Irritation (eye, rbt): 500 MG/24H MLD

..... Target Organ(s): Eyes, Skin.

Prolonged or repeated skin contact may cause dermatitis. Possible sensitizer by inhalation and skin contact.

SECTION 12 - ECOLOGICAL INFORMATION

..... Biodegradability: No information.
..... Aquatic Toxicity: No information.

SECTION 13 - DISPOSAL CONSIDERATIONS

Ensure disposal in compliance with government requirements and ensure conformity to local disposal regulations.
..... Contact a licensed professional waste disposal service to dispose of this material.
..... Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber.

SECTION 14 - TRANSPORTATION DATA

U.S. DOT 49 CFR 172.101:

PROPER SHIPPING NAME: Chemicals, n.o.s.
HAZARD CLASS AND LABEL: N/A
ID NUMBER: N/A
PACKAGING GROUP: N/A
SPECIAL PROVISIONS: N/A

LAND TRANSPORT ADR/RID:

PROPER SHIPPING NAME: Chemicals, n.o.s.
ADR/RID CLASS AND LABEL: N/A

UN NUMBER: N/A
PACKAGINGGROUP: N/A

AIR TRANSPORT IATA/ICAO:
PROPER SHIPPING NAME: Chemicals, n.o.s.
IATA/ICAO CLASS AND LABEL: N/A
UN/ID NUMBER: N/A
PACKAGING GROUP: N/A

MARITIME TRANSPORT:
PROPER SHIPPING NAME: Chemicals, n.o.s.
IMDG CLASS AND LABEL: N/A
UN NUMBER: N/A
PACKAGING GROUP: N/A

SECTION 15 - REGULATORY INFORMATION

5B= Clean Air Act Section 111 Volatile Organic Compounds.
CN1= Canadian Workplace Hazardous Materials Information System (WHMIS) Ingredient Disclosure List // Ingredient must be disclosed at a concentration of 1%.
NFPA HR: Health is 1; flammability is 1; reactivity is 0.
TSCA= This chemical is listed on the TSCA Inventory.
EINECS= 200-664-3

SECTION 16 - OTHER INFORMATION

NOTE: We believe that the information contained herein is current as of the date of this Material Safety Data Sheet. Since the use of this information and of these opinions and the conditions of the use of the product are not within the control of Aceto Corporation, it is the user's obligation to determine the conditions of safe use of the product.