



DIMETHYL SULFOXIDE - ALL GRADES

Material Safety Data Sheet

Arkema Inc.

1 PRODUCT AND COMPANY IDENTIFICATION

Thio and Fine Chemicals

Arkema Inc.
2000 Market Street
Philadelphia, PA 19103

EMERGENCY PHONE NUMBERS:

Chemtrec: (800) 424-9300 (24hrs) or (703) 527-3887
Medical: Rocky Mountain Poison Control Center
(866) 767-5089 (24Hrs)

Information Telephone Numbers	Phone Number	Available Hrs
Customer Service	1-800-628-4453	8:30 to 5:30 EST

Product Name DIMETHYL SULFOXIDE - ALL GRADES
Product Synonym(s) DMSO

Chemical Family Organic Sulfur
Chemical Formula (CH₃)₂SO
Chemical Name Methyl Sulfoxide
EPA Reg Num
Product Use Solvent

2 COMPOSITION / INFORMATION ON INGREDIENTS

Ingredient Name	CAS RegistryNumber	Typical Wt. %	OSHA
Dimethyl sulfoxide	67-68-5	100%	Y

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Hazard Communication Standard (29 CFR 1910.1200)

This material is classified as hazardous under Federal OSHA regulation.

The components of this product are all on the TSCA Inventory list.

3 HAZARDS IDENTIFICATION

Emergency Overview

Water white liquid with a strong solvent odor

CAUTION!

COMBUSTIBLE LIQUID AND VAPOR.

MAY CAUSE EYE IRRITATION.

PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION.

Potential Health Effects

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Based on single exposure animal tests, it is considered to be practically non-toxic if swallowed, absorbed through skin or inhaled and slightly irritating to eyes and skin. This material is readily absorbed through the skin and produces a characteristic garlic-like breath and taste. Repeated skin contact, used for medical purposes, has produced skin rashes, redness and drying of the skin, fatigue, dizziness, eye pain and headaches. Direct eye contact may produce a temporary burning sensation, but is only slightly irritating.

**4 FIRST AID MEASURES**

IF IN EYES, immediately flush with plenty of water. Get medical attention if irritation persists.

IF ON SKIN, immediately wash with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, induce vomiting as directed by medical personnel. Get medical attention. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

5 FIRE FIGHTING MEASURES**Fire and Explosive Properties**

Auto-Ignition Temperature	300 - 302 C		
Flash Point	87 C (188.6 F)	Flash Point Method	TCC
Flammable Limits- Upper	28.5		
Lower	2.6		

Extinguishing Media

Use water spray, carbon dioxide, foam or dry chemical.

Fire Fighting Instructions

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

Fire and Explosion Hazards

When burned, the following hazardous products of combustion can occur:

Oxides of carbon
Sulfur oxides
Hydrogen sulfide

6 ACCIDENTAL RELEASE MEASURES**In Case of Spill or Leak**

Extinguish or turn off all ignition sources. Ventilate the space involved. Wear appropriate personal protection equipment as indicated in Section 8 of this MSDS. Contain spill with inert materials. Construct a dike to prevent spreading. Collect with non-sparking tools to a suitable container. Prevent waterway contamination. Absorb liquid onto inert absorbent and place in DOT approved drums for disposal. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

7 HANDLING AND STORAGE**Handling**

Avoid contact with eyes, skin and clothing.
Wash thoroughly after handling.
Keep away from heat and flame.



7 HANDLING AND STORAGE

Use only with adequate ventilation.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned or destroyed. **DO NOT CUT OR WELD ON OR NEAR THIS CONTAINER.**

Storage

Store in well ventilated area away from heat and sources of ignition such as flame, sparks and static electricity. Ensure that all storage and handling equipment is properly rated, grounded and installed to satisfy electrical classification requirements. Static electricity may accumulate and create a fire hazard. All storage containers, including containers such as drums, cylinders and IBC's, must be bonded and grounded during filling and emptying operations. Store away from oxidizers and reactive materials. Keep container tightly closed. Observe all federal, state and local regulations and National Fire Protection Association (NFPA) Codes which pertain to the specific local conditions of storage and use, including OSHA 29 CFR 1910.106 and NFPA 30, 70, 77, and 497.

8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Investigate engineering techniques to reduce exposures. Provide ventilation if necessary to minimize exposures. If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment.

Eye / Face Protection

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment available.

Skin Protection

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Neoprene or Butyl rubber gloves should be worn when handling this material. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Wash contaminated clothing and clean protective equipment before reuse. Rinse contaminated skin promptly. Wash skin thoroughly after handling.

Respiratory Protection

Where airborne exposure is likely, use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. If exposures cannot be kept at a minimum with engineering controls, consult respirator manufacturer to determine appropriate type equipment for a given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where there may be a potential for significant exposure, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

Airborne Exposure Guidelines for Ingredients

Exposure Limit	Value
Dimethyl sulfoxide	
WEEL TWA	- 250 ppm

- Only those components with exposure limits are printed in this section.
- Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.
- ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.
- WEEL-AIHA Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic skin reactions.

9 PHYSICAL AND CHEMICAL PROPERTIES

Appearance/Odor	Water white liquid with a strong solvent odor
pH	NE
Specific Gravity	1.10 @ 20 C
Vapor Pressure	0.55 mbar @ 20 C
Vapor Density	2.7
Melting Point	NA
Freezing Point	18.5 C (65.21 F)
Boiling Point	189 C (372 F)
Solubility In Water	Completely soluble @ 20 C
Solubility in Other Materials	alcohols, ethyl ether
Percent Volatile	NE
Viscosity	2.14 cP @ 20 C
Molecular Weight	78.13
n-Octanol/Water Partition Coefficient	log Pow: -1.35
Other Physical Data	Refractive Index: 1.478 @ 20 C Henry's Constant: 7.77 E-9 atm m ³ /mole Decomposition Point: >190 C

10 STABILITY AND REACTIVITY**Stability**

This material is chemically stable under normal and anticipated storage and handling conditions.

Incompatibility

Contact with strong acids, strong oxidizers, sulfur, phosphorous, thionyls, or organic acid chlorides may cause a low energy release.

Hazardous Decomposition Products

At temperatures above 190 C or in an acidic environment the following decomposition products may be produced: oxides of sulfur, formaldehyde, methyl mercaptan, or dimethyl sulfide.

11 TOXICOLOGICAL INFORMATION**Toxicological Information**

Single exposure (acute) studies indicate:

Oral - Practically Non-toxic to Rats (LD50 14,000-28,000 mg/kg)

Dermal - Practically Non-toxic to Rats (LD50 40,000 mg/kg)

Inhalation - Practically Non-toxic to Rats (4-hr LC50 >5.3 mg/l aerosol; highest dose tested, no animal deaths)

Eye Irritation - Slightly Irritating to Rabbits

Skin Irritation - Slightly Irritating to Rabbits

This material is readily absorbed through the skin. No allergic skin reactions were observed in guinea pigs following repeated exposure. No adverse effects were observed in rats following repeated inhalation. Long-term oral or dermal administration to dogs, pigs, rats and rabbits produced minor effects on body weight and the blood, and on the skin after dermal administration. In dogs, pigs and rabbits, effects on the lens of the eye were noted. However, similar effects in eyes were not produced in rats after long-term oral administration or in rhesus monkeys after long-term oral or dermal administration, and have not been reported in humans treated for medical purposes. No birth defects were noted in the offspring of mice, rats and hamsters exposed orally during pregnancy (mice, hamsters) or prior to mating and throughout pregnancy (rats). Generally, no genetic changes were observed in tests using bacteria, animal cells, animals or fruit flies. A positive response was reported in one assay using bacteria and in one using animals.



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12 ECOLOGICAL INFORMATION

Ecotoxicological Information

This material is practically non-toxic to *Daphnia magna* (24-hr EC50 16,500 mg/l), *Hyalella azteca* (18-hr LC50 42,400 mg/l), blue-green algae (14-day EC50 3,570 mg/l), bluegill sunfish (96-hr LC50 >400,000 mg/l), rainbow trout (96-hr LC50 35,000 mg/l), fathead minnow (96-hr LC50 34,000 mg/l) and bacteria (16-hr EC10 7,100 mg/l). It is slightly toxic to activated sludge (30-minute EC50 10-100 mg/l).

Chemical Fate Information

Data on this material and/or its components are summarized below.

Dimethyl Sulfoxide

This material is readily biodegradable (94% after 27-days) and is biodegradable in water treatment plant (90% after 28-days; concentration 65 mg/l). It is degraded in air by OH radicals (half-life 4.5-hours). It is non-volatile, non-adsorbable and not bioaccumulable (log Pow -1.35).

13 DISPOSAL CONSIDERATIONS

Waste Disposal

Incineration is the recommended method for disposal observing all local, state and federal regulations. Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

14 TRANSPORT INFORMATION

DOT Name	Non Bulk Domestic/Bulk and Non bulk international: Not regulated
DOT Technical Name	
DOT Hazard Class	
UN Number	
DOT Packing Group	PG
RQ	
DOT Special Information	Domestic Bulk shipments: Combustible, liquid, n.o.s. (Dimethyl Sulfoxide) 3; NA 1993; PG III

15 REGULATORY INFORMATION

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y	Fire	Y
Delayed (Chronic) Health	N	Reactive	N
		Sudden Release of Pressure	N

The components of this product are all on the TSCA Inventory list.

Ingredient Related Regulatory Information:

SARA Reportable Quantities	CERCLA RQ	SARA TPQ
Dimethyl sulfoxide	NE	



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16 OTHER INFORMATION

Revision Information

Revision Date 26 OCT 2004 Revision Number 10

Supersedes Revision Dated 11-OCT-2004

Revision Summary

Added all the grades to the msds in section 16.

Key

NE= Not Established NA= Not Applicable (R) = Registered Trademark

Miscellaneous

Dimethyl sulfoxide technical, Dimethyl sulfoxide HP, Dimethyl sulfoxide EG, Digipur 10

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