MATERIAL SAFETY DATA SHEET

1. Product and Company Identification

Material name	**METHYL SULFOXIDE, Distilled in quartz solvent**
Catalog #	9610
Version #	02
Revision date	04-Mar-2010
CAS #	67-68-5
Synonym(s)	DIMETHYL SULFOXIDE * DMSO
Manufacturer information	GFS Chemicals, Inc. P.O. Box 245 Powell, OH 43065 US www.gfschemicals.com Fax 740-881-5989 Phone 740-881-5501 Toll Free 800-858-9682 Emergency Assistance Chemtrec 800-424-8300

2. Hazards Identification

Emergency overview	Contact with skin may cause irritation. Contact with eyes may cause irritation.
OSHA regulatory status	This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).
Potential health effects	
Routes of exposure	Skin contact. Eye contact.
Eyes	Harmful in contact with eyes.
Skin	Rapidly absorbed through skin. Contact with skin may cause irritation.
Inhalation	Health injuries are not known or expected under normal use.
Ingestion	Do not ingest.
Potential environmental effects	May cause long-term adverse effects in the environment.

3. Composition / Information on Ingredients

Components	CAS #	Percent
METHYL SULFOXIDE	67-68-5	90 - 100

4. First Aid Measures

First aid procedures

Eye contact	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation persists after washing.
Skin contact	Remove and isolate contaminated clothing and shoes. Wash off immediately with plenty of water. If skin irritation persists, call a physician.
Inhalation	If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Call a physician if symptoms develop or persist.
Ingestion	Have victim rinse mouth thoroughly with water. Do not induce vomiting without advice from poison control center. If ingestion of a large amount does occur, call a poison control center immediately.
General advice	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves.

5. Fire Fighting Measures

Flammable properties	Heat may cause the containers to explode. Runoff to sewer may cause fire or explosion hazard.

Extinguishing media

Suitable extinguishing media	Water. Water spray. Foam. Dry powder. Carbon dioxide (CO2).
Unsuitable extinguishing media	Do not use a solid water stream as it may scatter and spread fire.

Protection of firefighters

Protective equipment and precautions for firefighters	In case of fire and/or explosion do not breathe fumes. Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. If tank, rail car or tank truck is involved in a fire, ISOLATE for 800 meters (1/2 mile) in all directions; also consider initial evacuation for 800 meters (1/2 mile) in all directions. ALWAYS stay away from tanks engulfed in flame. Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. Move containers from fire area if you can do so without risk. In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers. Cool containers exposed to flames with water until well after the fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.
Specific methods	In the event of fire and/or explosion do not breathe fumes. In the event of fire, cool tanks with water spray. Use water spray to cool unopened containers.

6. Accidental Release Measures

Personal precautions	Keep unnecessary personnel away. Keep upwind. Keep out of low areas. Keep people away from and upwind of spill/leak. Ventilate closed spaces before entering them. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water.
Methods for containment	ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Use water spray to reduce vapors or divert vapor cloud drift. Prevent entry into waterways, sewers, basements or confined areas.
Methods for cleaning up	Should not be released into the environment. Large Spills: Dike far ahead of spill for later disposal. Use a non-combustible material like vermiculite, sand or earth to soak up the product and place into a container for later disposal. Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination. Following product recovery, flush area with water. Never return spills in original containers for re-use.

7. Handling and Storage

Handling	Do not handle or store near an open flame, heat or other sources of ignition. Do not smoke. All equipment used when handling the product must be grounded. Avoid contact with skin. Avoid contact with eyes. Use only with adequate ventilation. Wear personal protective equipment. Wash thoroughly after handling. Avoid release to the environment.
Storage	The pressure in sealed containers can increase under the influence of heat. Keep away from heat and sources of ignition. This material can accumulate static charge which may cause spark and become an ignition source. Prevent electrostatic charge build-up by using common bonding and grounding techniques. Keep container tightly closed. Use care in handling/storage.

8. Exposure Controls / Personal Protection

Engineering controls	Ensure adequate ventilation, especially in confined areas.

Personal protective equipment

Respiratory protection	In case of insufficient ventilation wear suitable respiratory equipment. No personal respiratory protective equipment normally required.
Hand protection	Wear protective gloves.
Eye / face protection	Wear chemical goggles. Avoid contact with eyes.
Skin protection	Avoid contact with the skin. Wear appropriate chemical resistant clothing. Wear suitable protective clothing. Wear protective gloves.

General hygeine considerations	When using do not smoke. Avoid contact with eyes. Avoid contact with skin.
General	Avoid contact with skin. Avoid contact with eyes.

9. Physical & Chemical Properties

Appearance	Clear.
Color	Colorless.
Odor	Nearly odorless.
Odor threshold	Not available.
Physical state	Liquid.
Form	Liquid.
pH	Not available.
Melting point	64.4 °F (18.45 °C)
Freezing point	64.4 °F (18.45 °C)
Boiling point	372.2 °F (189 °C)
Flash point	203 °F (95 °C) estimated Open Cup
Evaporation rate	Not available.
Flammability	Not available.
Flammability limits in air, upper, % by volume	42 %
Flammability limits in air, lower, % by volume	2.6 %
Vapor pressure	0.056 kPa at 20°C
Vapor density	Not available.
Specific gravity	1.1
Relative density	1.0999 g/cm3 estimated
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	-2.03
Auto-ignition temperature	419 °F (215 °C) estimated
Decomposition temperature	Not available.
VOC	100 %
Percent volatile	100 %
Molecular weight	78.1300 g/mol
Molecular formula	(CH3)2SO

10. Chemical Stability & Reactivity Information

Chemical stability	Stable at normal conditions.
Conditions to avoid	Heat, flames and sparks. The substance is hygroscopic and will absorb water by contact with the moisture in the air.
Incompatible materials	Oxidizing agents. Reactive with many acyl, aryl, and non-metal halides.
Hazardous decomposition products	Carbon dioxide, carbon monoxide, oxides of sulfur and nitrogen.
Possibility of hazardous reactions	Hazardous polymerization does not occur.

11. Toxicological Information

Acute effects

Acute Oral: LD 50

METHYL SULFOXIDE	67-68-5	Mouse 7920 mg/kg
METHYL SULFOXIDE	67-68-5	Rat 14500 g/kg
METHYL SULFOXIDE	67-68-5	Rat 17.9 ml/kg

Acute Toxicity other routes: LD 50

METHYL SULFOXIDE	67-68-5	Mouse 3800 mg/kg Intravenous
METHYL SULFOXIDE	67-68-5	Rat 8200 mg/kg Intraperitoneal
METHYL SULFOXIDE	67-68-5	Rat 5360 mg/kg Intravenous
METHYL SULFOXIDE	67-68-5	Rat 12000 mg/kg Subcutaneous
METHYL SULFOXIDE	67-68-5	Mouse 2500 mg/kg Intraperitoneal
METHYL SULFOXIDE	67-68-5	Dog 2500 mg/kg Intravenous

Toxicology data for the preparation

Acute LD50: 2500 mg/kg, Dog, Other
Acute LD50: 2500 mg/kg, Mouse, Other
Acute LD50: 3800 mg/kg, Mouse, Other
Acute LD50: 12000 mg/kg, Rat, Other
Acute LD50: 5360 mg/kg, Rat, Other
Acute LD50: 8200 mg/kg, Rat, Other
Acute LD50: 7920 mg/kg, Mouse, Oral
Acute LD50: 14500 g/kg, Rat, Oral
Acute LD50: 17.9 ml/kg, Rat, Oral

Local effects Irritating to eyes. Irritating to skin.

Carcinogenicity This product is not considered to be a carcinogen by IARC, ACGIH, NTP, or OSHA.

Mutagenicity Mutagenic data.

Reproductive effects Experimental reproductive effects.

Teratogenicity Experimental teratogen.

12. Ecological Information

Ecotoxicity Components of this product have been identified as having potential environmental concerns.

Environmental effects An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.

Persistence and degradability Not available.

Partition coefficient -2.03

13. Disposal Considerations

Disposal instructions Do not allow this material to drain into sewers/water supplies. This product, in its present state, when discarded or disposed of, is not a hazardous waste according to Federal regulations (40 CFR 261.4 (b)(4)). Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste. Dispose in accordance with all applicable regulations.

14. Transport Information

DOT

Not regulated as dangerous goods.

15. Regulatory Information

US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
All components are on the U.S. EPA TSCA Inventory List.

CERCLA/SARA Hazardous Substances - Not applicable.

CERCLA (Superfund) reportable quantity

None

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories	Immediate Hazard - Yes Delayed Hazard - No Fire Hazard - Yes Pressure Hazard - No Reactivity Hazard - No
Section 302 extremely hazardous substance	No
Section 311 hazardous chemical	Yes

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of New and Existing Chemicals (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

State regulations This product does not contain a chemical known to the State of California to cause cancer, birth defects or other reproductive harm.

16. Other Information

Further information	HMIS® is a registered trade and service mark of the NPCA.
HMIS® ratings	Health: 2 Flammability: 2 Physical hazard: 0
NFPA ratings	Health: 2 Flammability: 2 Instability: 0
Disclaimer	The information in the sheet was written based on the best knowledge and experience currently available. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.
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This data sheet contains changes from the previous version in section(s):	This document has undergone significant changes and should be reviewed in its entirety.