



# Material Safety Data Sheet

FLXP0052

Date of Printing: 12/08/2000

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: SULFASAN DTDM

MSDS NO. FLXP0052

Chemical Name: 4,4'-Dithiobismorpholine

Synonyms: Sulfasan R; Dimorpholinodisulfide; N,N'-Dithiodimorpholine.

Use: Sulfur Donor

Manufactured By: Flexsys America L.P. 260 Springside Drive Akron OH 44333 USA

Emergency Telephone: CHEMTREC: 1-800-424-9300 (TOLL FREE - USA and Territories)  
703-527-3887 (ELSEWHERE - Collect Calls Accepted)

CANUTEC: 613-996-6666 (Canada)

SETIQ: 91-800-00-214 (Mexico)

Prepared By: Flexsys America Product Safety Phone (330) 668-8281 FAX (330) 668-8281

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

Components/CAS#	Percent
4,4'-Dithiobismorpholine 103-34-4	96-99
White Mineral Oil 8042-47-5	0-2
Morpholine 110-91-8	0-0.5

## 3. HAZARDS IDENTIFICATION

### Hazard Information

**Emergency Overview:** WARNING! Combustible dust - explosion potential. Keep away from heat, sparks, and flame. This material is irritating to skin, eyes and respiratory tract.

**Eye Contact:** Causes eye irritation. Moderate Eye Irritation: signs/symptoms can include redness, swelling, pain, tearing, and hazy vision.

**Skin Contact:** May cause an allergic skin reaction. May cause a rash and itching of the skin. May cause skin defatting with prolonged exposure.

**Inhalation:** Causes moderate respiratory irritation. Irritating vapor causes immediate distress. Irritates mucous membranes. Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.

**Ingestion:** May be harmful if large amounts are swallowed. May cause vomiting.

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MARKETED BY  
**HARWICK STANDARD**  
DISTRIBUTION CORPORATION  
60 S. Selberling Street • Akron, Ohio 44305

#### 4. FIRST AID MEASURES

<b>In Eyes:</b>	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
<b>On Skin:</b>	Remove contaminated clothing. Wash skin with water, using soap if available. Remove contaminated clothing and laundry before reuse. Get medical attention if irritation persists.
<b>Inhaled:</b>	Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
<b>Swallowed:</b>	If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.
<b>Notes To Physician:</b>	Provide symptomatic/supportive care as necessary. Treatment based on sound judgment of physician and individual reactions of patient. Observe for signs of respiratory distress.

#### 5. FIRE FIGHTING MEASURES

<b>Flash Point (°F/C):</b>	309°F / 154°C
<b>Flash Point Method:</b>	Cleveland Open Cup
<b>Autoignition Temp. (°F/C):</b>	Not Determined
<b>Lower Explosion Limit in Air (LEL):</b>	Not Determined
<b>Upper Explosion Limit in Air (UEL):</b>	Not Determined.
<b>Extinguishing Media:</b>	Water fog, carbon dioxide, foam, dry chemical
<b>Special Exposure Hazards:</b>	Fight fire from a safe distance and from a protected location. Flammable dust when in finely divided and highly suspended state. Use water spray to cool fire exposed surfaces. Decomposition in fire may produce toxic gases. Do not allow runoff to enter waterways.
<b>Special Protective Equipment:</b>	Fire fighters should wear full protective clothing, including self-contained breathing equipment.
<b>Unusual Fire/Explosion Hazards:</b>	Toxic emissions may result if product is involved in a fire. Fire produces highly toxic sulfur dioxide gas

#### 6. ACCIDENTAL RELEASE MEASURES

<b>Spill Procedures:</b>	Wear protective equipment specified. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.
<b>Procedure for Cleaning/Absorption:</b>	Isolate area and remove sources of friction, impact, heat, low level electrical current, and RF energy. Isolate spill and stop leak where safe. Remove ignition sources and work with non-sparking tools. Scoop up and remove. Do NOT spread spilled product with water.
<b>CERCLA Reportable Quantity (RQ):</b>	Not Applicable

#### 7. HANDLING AND STORAGE

<b>Handling:</b>	Good hygienic practices should be observed. Work clothes should be washed separately at the end of each work day. Disposable clothing should be discarded with material. Avoid generating or breathing dust. Avoid contact with eyes, skin and clothing. Reclose containers of unused product. Wash hands before eating, drinking, chewing gum, using tobacco or using the toilet. Do not reuse this container.
<b>Storage:</b>	Store closed containers in a cool, dry, well-ventilated area. Store away from strong oxidizing materials. Avoid exposure to direct sunlight. Do not store near Crystex Insoluble Sulfur. Slowly degrades and releases irritating vapors under warm, humid conditions.

#### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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<b>Eye Protection:</b>	Wear safety glasses or goggles to protect against exposure.
<b>Skin Protection:</b>	Normal work coveralls. Launder contaminated clothing before reuse.
<b>Gloves:</b>	Use gloves as a standard industrial handling procedure. All cleanable impervious glove types are acceptable.
<b>Respiratory Protection:</b>	Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure. Firefighting; use a Positive Pressure Demand Full Face Self Contained Breathing Apparatus.
<b>Ventilation:</b>	General; local exhaust ventilation as necessary to control any air contaminants to within their exposure limits during the use of this product. Adequate ventilation should be provided to keep dust concentrations below acceptable exposure limits. Discharge from the ventilation system should comply with the applicable air pollutions control regulations. Eliminate ignition sources.
<b>Airborne Exposure Limits:</b>	Nuisance Dust. OSHA PEL/8Hr-TWA = 15 mg/m <sup>3</sup> (Total Dust). OSHA PEL/8-Hr TWA = 05 mg/m <sup>3</sup> (Respirable Dust). ACGIH TLV/8-Hr TWA = 10 mg/m <sup>3</sup> . Morpholine: OSHA PEL/8Hr TWA = 20 ppm. ACGIH TLV/8Hr TWA = 20 ppm *skin. NIOSH REL/8Hr TWA = 20 ppm *skin. NIOSH STEL = 30 ppm *skin

## 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance:</b>	White to off-white powder
<b>Odor:</b>	MILD AMINE
<b>pH:</b>	N/A
<b>Specific Gravity:</b>	1.36 @ 25°C
<b>Density:</b>	Unknown
<b>Bulk Density:</b>	1360 kg/m <sup>3</sup>
<b>Melting Point (°F/C):</b>	123-131°C
<b>Boiling Point (°F/C):</b>	Not Determined
<b>Vapor Pressure:</b>	Negligible
<b>Vapor Density (Air=1):</b>	Not Determined
<b>% Volatile by Volume:</b>	<0.5%
<b>Solubility in Water:</b>	0.0082 g/100ml @25°C
<b>Other Solubility:</b>	Soluble in Acetone Organic liquids, including fats and oils Alcohol Benzene Naphtha
<b>Viscosity:</b>	Not determined.
<b>Other Data:</b>	Not determined.
<b>Molecular Weight:</b>	236.4
<b>Molecular Formula:</b>	C8-H16-N2-O2-S2

## 10. STABILITY AND REACTIVITY

<b>Chemical Stability:</b>	Stable when stored at room temperature in closed, original container. Stable under normal conditions of handling, use and transportation. Stable if protected from heat and exposure to air. Loses potency with time Protect from moisture
<b>Hazardous Polymerization:</b>	Will not occur
<b>Conditions to Avoid:</b>	Keep away from heat, sparks and flame. Avoid contact with strong oxidants such as liquid chlorine and concentrated oxygen.
<b>Materials to Avoid:</b>	Reducing agents. Contact with acids. Avoid contamination of product with small amounts of water. Do not store near Crystex Insoluble Sulfur.
<b>Hazardous Decomposition Products:</b>	Carbon monoxide Oxides of nitrogen Oxides of sulfur Amines Hydrogen sulfide
<b>Additional Guidelines:</b>	Amine vapors can cause insoluble sulfur to revert to soluble form.

## 11. TOXICOLOGICAL INFORMATION

<b>Target Organs</b>	
<b>Acute Oral LD50 (mg/kg):</b>	5600 mg/kg
<b>Acute Dermal LD50 (mg/kg):</b>	>5010 mg/kg

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<b>Acute Inhalation LC50 (mg/l):</b>	Not Determined
<b>Principle Routes of Exposure:</b>	Eyes. Inhalation. Dermal - skin.
<b>Ingestion:</b>	May be harmful if large amounts are swallowed. May cause vomiting.
<b>Skin Contact:</b>	May cause an allergic skin reaction. May cause a rash and itching of the skin. May cause skin defatting with prolonged exposure.
<b>Inhalation:</b>	Causes moderate respiratory irritation. Irritating vapor causes immediate distress. Irritates mucous membranes. Irritation (upper respiratory): signs/symptoms can include soreness of the nose and throat, coughing and sneezing.
<b>Eye Contact:</b>	Causes eye irritation. Moderate Eye Irritation: signs/symptoms can include redness, swelling, pain, tearing, and hazy vision.
<b>Aggravated Conditions:</b>	Pulmonary disorders. Dermal ailments. Eye, skin, respiratory, blood, liver and/or kidney ailments. This material or its emissions may cause an allergic or sensitization reaction and thereby aggravate systemic disease.
<b>Carcinogenicity Comment:</b>	This product or one of its ingredients present 0.1% or more is NOT listed as a carcinogen or suspected carcinogen by NTP, IARC, or OSHA. Carcinogenic: Category 3
<b>Other:</b>	Decomposition products and fumes from vulcanization and cross-linking may cause eye, skin and respiratory sensitization. May be a skin sensitizer. Product releases amine vapors during cure.
<b>Primary Irritation Effect:</b>	Moderately irritating. Sensitizer.
<b>Carcinogenicity:</b>	Both negative and positive results in standard tests using animals, animal and bacterial cells.
<b>Genotoxicity:</b>	No adverse effects in standard tests using yeast cells.
<b>Reproductive/Developmental Toxicity:</b>	No evidence of teratogenicity in animal studies using rats, mice and hamsters

## 12. ECOLOGICAL INFORMATION

<b>Acute Fish Toxicity:</b>	96Hr LC50 Rainbow Trout = 1.8 mg/l. 96Hr LC50 Bluegill Sunfish = 1.6 mg/l. 96Hr LC50 Fathead Minnow = 3.5 mg/l.
<b>Acute Crustaceans Toxicity:</b>	48Hr EC50 Daphnia Magna: 4.5 mg/l.
<b>Acute Algae Toxicity:</b>	96Hr EC50 Algae = 29.0 mg/l.
<b>Octanol/Water Coefficient:</b>	310
<b>Chemical Fate Information:</b>	Bioconcentration Factor: 29 (calculated). Aqueous Photolysis: T(1/2) = 3 Hrs.
<b>Other Information:</b>	Not Available

## 13. DISPOSAL CONSIDERATIONS

**Disposal of Waste Method:**  
This material is not a RCRA hazardous waste. Bury in a licensed landfill or burn in an approved incinerator according to federal, state, and local regulations. Empty containers should be handled in a manner not to cause dusting during collection, transportation and disposal.

**Contaminated Packaging:**  
If empty container retains product residues, all label precautions must be observed. Store away from ignition sources. Transport with all closures in place. Return for reuse or dispose according to national or local regulations. Dispose of container according to national or local regulations.

## 14. TRANSPORT INFORMATION

<b>DOT:DOT Status:</b>	Not Regulated
<b>DOT Shipping Name:</b>	NONE
<b>DOT Reportable Quantity (lbs):</b>	None

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ICAO/IATA:Status:	NOT REGULATED FOR TRANSPORTATION
Proper Shipping Name:	None
UN/NA Number:	NONE
IMDG:Status:	Not Regulated
Proper Shipping Name:	None
TDG (Canada):Status:	Not Regulated
Proper Shipping Name:	None

## 15. REGULATORY INFORMATION

### Worldwide Inventory Status

TSCA (USA):	Listed
Canadian DSL:	Listed
Canadian NDSL:	N/A
EINECS/ELINCS (Europe):	Listed
Japanese Inventory (ENCS):	Listed
Korean Chemical Inventory (ECL):	Listed
Australian Chemical Inventories (AICS):	Listed
New Zealand (NZ):	Listed
Phillipines (PICCS) Inventory:	Listed
China (CLECS):	Listed

### US Regulatory Rules

SARA Section 302:	None Found
SARA 311/312 Hazard Categories:	Immediate Delayed Fire
SARA 313 Chemical:	N/A
RCRA Status:	Not a RCRA waste.

### Other Regulations:

California Proposition 65:	NONE
New Jersey Right-to-Know List:	N/A
Pennsylvania Right to Know List:	N/A
Florida Right to Know:	N/A
Minnesota Right to Know:	N/A
MA Right to Know Law:	N/A

FDA Status 21 CFR:	Regulated for Use under the following sections of 21 CFR: 177.2600 Rubber Articles Intended for Repeated Use in Food Contact. 175.105 Components of Adhesives.
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### Canadian Regulations

WHMIS Hazard Class:	D2B TOXIC MATERIALS / Materials Causing Other Toxic Effects
NPRI:	N/A

## 16. OTHER INFORMATION

### Hazard Rating Systems:

HMIS Classification:	HEALTH 1, FLAMMABILITY 1, REACTIVITY 0
NFPA Rating:	HEALTH 1, FLAMMABILITY 1, REACTIVITY 0

The following has been revised since the last issue of this MSDS:  
Nothing has been revised.

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**Additional Information:** WHMIS Ingredient Disclosure List (Canada)

**Important Note:** This information is furnished without warranty, expressed or implied, as to accuracy or completeness. The information is obtained from various sources including the manufacturer and other third party sources. The information may not be valid under all conditions nor if this material is used in combination with other materials or in any process. Final determination of suitability of any material is the sole responsibility of the user.

**\*\*\*END OF MSDS\*\*\***



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