



Chemicals Corp.

Technical Data Sheet

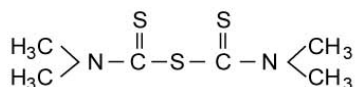
TMTM

Tetramethyl thiuram monosulfide

CAS Number: 97-74-5

Molecular weight: 208.4

Molecular formula: C₆H₁₂N₂S₃



PRODUCT INFORMATION

PRODUCT SPECIFICATIONS		GRANULES	OIL POWDER	POWDER
Appearance		Yellow granules	Yellow oil powder	Yellow powder
Melting Point	°C min	105.0	105.0	105.0
Loss on drying	% max	0.30	0.40	0.30
Ash	% max	0.30	0.40	0.30
Residue on sieve (63µm)	% max	-	0.50	0.50
Residue on sieve (150µm)	% max	-	0.10	0.10
Oil content	%	-	1.0-2.0	-
<u>Typical properties</u>				
Density	g/cm ³	1.37-1.40		
<u>Packaging</u>				
Bag		25kg (55 lbs)		
Pallet		500kg or 600kg (1102 lbs or 1323 lbs)		

FUNCTION

- TMTM is generally used as a secondary accelerator or as a booster for sulphenamides to achieve faster cure rates.

APPLICATIONS AND PROPERTIES

- TMTM is distinguished by very good processing safety in comparison with other thiurams.
- This product has a high curing rate and no discolouration.
- Produces no curing activity in the absence of added elemental sulphur.
- TMTM is an excellent accelerator for polychloroprene in association with DPG and sulphur.
- Product is odourless and has no taste.
- Soluble in chloroform, acetone, benzene, CH₂, Cl₂, CS₂, and toluene; partly soluble in diethyl ether.
- Insoluble in water in gasoline.
- TMTM is regulated for use under the following sections of FDA 21 CFR:
175.105 – Components of Adhesives.
177.2600 – Rubber Articles Intended for Repeated Use in Food Contact.

STORAGE

Material should be stored in a tightly closed container in a cool, dry, well ventilated area. Product should not be stacked. Stacking of palletized material or temperatures of above 35°C can cause unusual compacting of the product. The maximum recommended storage life is 2 years when stored under normal conditions.

HANDLING PRECAUTIONS

For detailed information on toxicological properties and handling precautions, please refer to the current Safety Data Sheet. This information is available by request from **SunBoss Chemicals Corp.**

[Revised: November 6, 2014 by kk]

Safety Data Sheet

TMTM

1. IDENTIFICATION OF SUBSTANCE / COMPANY INFORMATION

Chemical Name	Tetramethyl thiuram monosulfide
Synonyms	Accelerator TMTM; TS
CAS #	97-74-5
Formula	C ₆ H ₁₂ N ₂ S ₃
Chemical Family	Accelerator
Supplier	SunBoss Chemicals Corp.
Address	8-110 West Beaver Creek Road Richmond Hill, ON L4B 1J9
Telephone	905-707-3433
Fax	905-707-7393

Emergency Information

After normal hours call Chemtrec at 1-800-424-9300

2. COMPOSITION / INFORMATION ON INGREDIENTS

<u>Component</u>	<u>CAS No.</u>	<u>Weight %</u>	<u>UN No.</u>
Tetramethyl thiuram monosulfide	97-74-5	98	202-605-7
White Mineral Oil (powder only)	8042-47-5	1-2	232-455-8
	<u>Symbol(s)</u>	<u>Risk Phrase(s)</u>	
	Xn, N	R22, R43, R50/53	

3. HEALTH HAZARDS INFORMATION

EMERGENCY OVERVIEW

Signal Word: WARNING!

Harmful if swallowed!

May cause sensitisation by skin contact.

Inhalation and ingestion may cause alcohol intolerance (Antabuse Effect).

Very toxic to aquatic organisms may cause long-term adverse effects in the aquatic environment.

Potential Health Effects

Inhalation

Exposure to dust particles generated from this material may cause irritation of the respiratory tract. Inhalation may cause alcohol intolerance

Ingestion

May cause alcohol intolerance (Antabuse Effect) May cause headache, dizziness, nausea, vomiting, gastrointestinal irritation.

Skin contact	May cause an allergic skin reaction. May be absorbed through the skin and produce effects similar to those caused by inhalation and/or ingestion.
Eye Contact	Causes mild eye irritation. Signs/symptoms can include redness, swelling, pain, and tearing.

4. EMERGENCY FIRST AID PROCEDURES

Inhalation	Remove person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, get immediate medical attention.
Ingestion	If swallowed, call a physician immediately. Only induce vomiting at the instruction of a physician. Never give anything by mouth to an unconscious person.
Skin	In case of contact, immediately flush skin with plenty of soap and water for at least 15 minutes. Get medical attention. Remove contaminated clothing and launder before reuse. Get medical attention if irritation persists.
Eyes	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes and get medical attention if irritation persists.
Note to Physician	Treat symptomatically. Exposure by ingestion, inhalation or skin absorption may cause alcohol intolerance (Antabuse Effect)

5. FIRE AND EXPLOSION HAZARD MEASURES

Flammability	Not determined
Flash Point	318°F / >150°C
Flash Point Method	Pensky-Martens Open Cup
DOT Category	UN 3077, Environmentally Hazardous Substance, Solid, N.O.S. (Tetramethyl thirum monosulfide), 9, PG III
Extinguishing Media	Water fog, carbon dioxide, foam, dry chemical
Auto Ignition Temperature	>200°C
Flammable Limits	Not determined
Special Fire Fighting Procedures	Fight fire from a safe distance and from a protected location. Use water spray to cool fire exposed surfaces. Decomposition in fire may produce toxic gases. Do not allow runoff to enter waterways.
Special Protective Equipment	Full protective clothing and approved self-contained breathing apparatus required for fire-fighting personnel.
Unusual Fire and Explosion Hazards	Toxic emissions may result if product is involved in a fire.

6. ACCIDENTAL RELEASE MEASURES

Procedures	Wear protective equipment specified. Avoid the generation of dust. Sweep, vacuum, or shovel and place into closable container for disposal.
------------	---

Clean up Methods

Isolate area and remove sources of friction, impact, heat, low level electrical current, and RF energy. Scoop up and remove. Do NOT spread spilled product with water.

7. HANDLING AND STORAGE

Handling

Avoid contact with eyes, skin and clothing. Avoid generating or breathing dust. Wash thoroughly with soap and water after handling. Wash hands before eating, drinking, and chewing gum, using tobacco or using the toilet. Close containers of unused product. Keep containers tightly closed when not in use. Do not reuse this container.

Storage

Store closed containers in a cool, dry, well-ventilated area. Store away from strong oxidizing materials. Avoid exposure to direct sunlight.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering Controls

Avoid dust generation. Ensure good ventilation and local exhaustion of the working area as necessary to control any air contaminants to within their exposure limits. Eliminate ignition sources.

Exposure Limits

Tetramethyl thiuram monosulfide
White Mineral oil

ACGIH (TWA)

Not Established
5 mg/m³

OSHA (TWA)

Not Established
5 mg/m³



Respiratory



Use in a well-ventilated area. Use approved NIOSH respiratory protection if TLV exceeded. Or over exposure is likely. Appropriate respiratory protection shall be worn when applied engineering controls are not adequate to protect against inhalation exposure.

Eyes

Wear safety glasses or goggles to protect against exposure.

Skin

Normal work coveralls. Launder contaminated clothing before reuse.

Gloves

Use gloves as a standard industrial handling procedure. Appropriate chemical resistant gloves should be worn.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Yellow powder or granules

Odour

Slightly aromatic

Specific Gravity

1.4 @20°C

Density

1.37-1.40 g/cm³

Bulk Density

400-440 kg/m³ @20°C

Solubility in water	INSOLUBLE
pH	Not applicable
Other Solubility	Soluble in chloroform, acetone, benzene, CH ₂ , Cl ₂ , CS ₂ and toluene - partly soluble in diethyl ether
Boiling point	Not determined
Melting Point	105°C
Molecular Weight	208.4
Molecular Formula	C ₆ H ₁₂ N ₂ S ₃

10. STABILITY AND REACTIVITY

Chemical Stability	Stable when stored at room temperature in closed, original container. Stable under normal conditions of handling, use and transportation.
Conditions to avoid	Oxidizing agents
Incompatibility	Avoid contact with acidic, basic or oxidizing agents.
Hazardous Polymerization	Will not occur
Hazardous Decomposition Products	Carbon monoxide. Oxides of nitrogen and sulfur
Additional Guidelines	None

11. TOXICOLOGICAL INFORMATION

Acute oral LD 50 (mg/kg)	1320 mg/kg - Rat
Acute Dermal LD 50 (mg/kg)	>2000 mg/kg - Rabbit
Acute Inhalation LC50 (mg/l)	Not determined
Principle routes of Exposure	Dermal - skin. Inhalation.
Ingestion	May cause alcohol intolerance (Antabuse Effect) May cause headache, dizziness, nausea, vomiting, gastrointestinal irritation.
Skin contact	May cause an allergic skin reaction. May be absorbed through the skin and produce effects similar to those caused by inhalation and/or ingestion.
Inhalation	Exposure to dust particles generated from this material may cause irritation of the respiratory tract. Inhalation may cause alcohol intolerance
Eye Contact	Causes mild eye irritation. Signs/symptoms can include redness, swelling, pain, and tearing.
Aggravated Conditions	Alcohol consumption problems.

Carcinogenicity	Negative in standard tests using bacteria and yeast cells. 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 NOTE: May react with nitrosating agents during rubber vulcanization to form nitrosamines. Some nitrosamines are suspect human carcinogens.
Primary Irritation Effect	Practically non-irritating
Genotoxicity	None
Reproductive/Developmental Toxicity	No evidence of teratogenicity in animal studies using rats, mice and hamsters

12. ECOLOGICAL INFORMATION

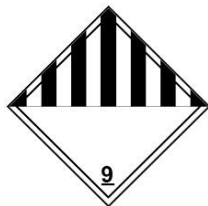
Acute Fish Toxicity	96Hr LC50 Rainbow Trout 2.3 mg/l 96Hr LC50 Bluegill Sunfish 2.6 mg/l
Acute Crustacean Toxicity	96Hr EC50 Daphnia Magna 1.6 mg/l
Octonal/Water Coefficient	Log P=0.75(Estimated).
Chemical Fate Information	Bio-concentration Factor:2
Other Information	None

13. DISPOSAL CONSIDERATIONS

Waste Disposal	This product, if disposed as received, is a non-hazardous waste. Bury in a licensed landfill or burn in an approved incinerator according to federal, state, and local regulations. Federal, state and local disposal laws and regulations will determine the proper waste disposal/recycling/reclamation procedure. Disposal requirements are dependent on the hazard classification and will vary by location and the type of disposal selected.
Contaminated Packaging	If empty container retains product residues, all label precautions must be observed. Transport with all closures in place. Return for reuse or dispose according to national or local regulations. Do NOT reuse container. Dispose of container according to national or local regulations.

14. TRANSPORT INFORMATION

DOT

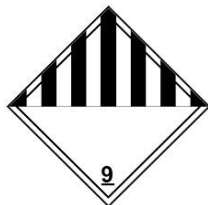


UN/IN No.	3077
Proper Shipping Name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., (Tetramethyl thiruam monosulfide)
Hazard Class	9
Packing Group	III

Reportable Quantity (RQ) 10 lbs

Note: The (RQ) for this product is 10 lbs. Any package containing 10 lbs or more, must be labelled, marked and shipped as hazardous material. Single packages under 10 lbs are considered non-hazardous for transport.

IATA



UN/IN No.
Proper Shipping Name

3077
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.,
(Tetramethyl thiruum monosulfide)

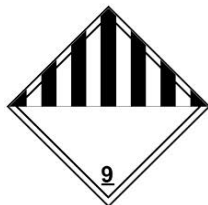
Hazard Class
Packing Group
Special Markings

9
III
Symbol (fish and tree)

Note:

EFFECTIVE 01/01/2009: Subject to ICAO/IATA ENVIRONMENTALLY HAZARDOUS SUBSTANCE marking requirement [IATA 7.1.6.3]
Passengers: Packaging instruction 911 (No restricted quantity by package),
Cargo: Packaging instruction 911 (No restricted quantity by package)

IMDG



UN/IN No.
Proper Shipping Name

3077
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S.,
(Tetramethyl thiruum monosulfide)

Hazard Class
Packing Group
Marine Pollutant
Special Markings:

9
III
Yes
Symbol (fish and tree)

TDG (Canada)

See DOT

15. REGULATORY INFORMATION

LABELLING ACCORDING TO DIR 67/548 EEC

EC Number: 205-286-2
Classification based on: TESTS



HARMFUL (Xn)



DANGEROUS FOR THE ENVIRONMENT (N)

CLASSIFIED ACCORDING TO DIRECTIVE 199/45/EC

Risk Phrases:

R22 - Harmful if swallowed.
R43 – May cause sensitisation by skin contact.
R50/53 – Very toxic to aquatic organisms, may cause long term adverse effects in the aquatic environment.

Safety Phrases:

S24– Avoid contact with skin.
S26 – In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
S36/37 – Wear suitable protective clothing and gloves.
S60 – This material and its container must be disposed of as a hazardous waste.
S61 – Avoid release to the environment. Refer to Special Instructions/Safety Data Sheet.

FDA Status 21 CFR

Regulated for use under the following sections of 21 CFR:
175.105 Components of Adhesives.
177.2600 Rubber Articles Intended for Repeated Use in Food Contact.

TSCA

Listed

Canadian DSL

Listed

EINECS/ELINCS

Listed

US Regulations

SARA Section 302
SARA 311/312 Hazard Categories
SARA 313 Chemical
RCRA Status

Not applicable
Immediate Delayed
Not determined
Not a RCRA waste

Canadian Regulations

WHMIS Hazard Class



NPRI

D2B TOXIC MATERIALS / Materials Causing Other Toxic Effects.

Not determined

16. HAZARD RATING SYSTEM

NFPA Rating (Scale 0-4)

- 0 - Minimal Hazard
- 1 - Slight Hazard
- 2 - Moderate Hazard
- 3 - Serious Hazard
- 4 - Severe Hazard

HEALTH	2
FIRE	1
REACTIVITY	0

HMIS Classification (Scale 0-4)

- 0 - Minimal Hazard
- 1 - Slight Hazard
- 2 - Moderate Hazard
- 3 - Serious Hazard
- 4 - Severe Hazard

HEALTH	2
FIRE	1
REACTIVITY	0

17. OTHER INFORMATION

Although reasonable precautions have been taken in the preparation of the data contained herein, it is offered solely for your information, consideration and investigation. SunBoss Chemicals Corp. extends no warranty and assumes no responsibility for the accuracy or sufficiency of the content and expressly disclaims all liability for reliance thereon. This material safety data sheet provides guidelines for the safe handling of this product; it does not and cannot advise on all possible situations, therefore, your specific use of this product should be evaluated to determine if additional precautions are required. It is the responsibility of the user to comply with all Federal, State and local laws and regulations. Individuals exposed to this product should read and understand this information and be provided pertinent training prior to working with this product.

Abbreviations and Acronyms

ACGIH: American Conference of Governmental Industrial Hygienists Inc.
CAS: Chemical Abstracts Service (Division of American Chemical Society)
DOT: Department of Transportation (USA)
EINECS: European Inventory of Existing Commercial Chemical Substances
HMIS: Hazardous Materials Identification System (USA)
IARC: Internal Agency for Research on Cancer
IATA: International Air Transport Association
IMDG: International Marine Code for Dangerous Goods
LD50: Lethal Dose Medium
LC50: Lethal Concentration Medium
EC50: Effective Concentration Medium
NIOSH: National Institute for Occupational Safety and Health
NFPA: National Fire Protection Association (USA)
NPRI: National Pollutant Release Inventory (Canada)
NTP: National Toxicology Program
OSHA: Occupational Safety and Health Administration (USA)
TDG: Transportation of Dangerous Goods (Canada)
TLV: Threshold Limit Value
TWA: Time Weighted Average
WHMIS: Workplace Hazardous Materials Information Systems (Canada)

18. REVISION DATE

Revision number: 5

Date of Issue: September 3, 2014

Changes: Number and format of headings changed; Updates to Sections 1: Identification of Substance - EC information added; 2: Health Hazards Information; 8: Specific Personal Protection Equipment - pictograms added; 14: Transport information - pictograms added; 15: Regulatory information - EC information added; 16: Hazard Rating System - table added; 17: Abbreviations and Acronyms added