



MERCHEM LIMITED

SAFETY DATA SHEET

MERDONOR DTDM
MSDS No. 41/20.03.2015

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND THE COMPANY/UNDERTAKING

1.1 Product Identifier

Product Name Merdonor DTDM
Synonym 4,4'-Dithiodimorpholine,
Di-morpholine disulfide

1.2 Use of the Substance/Mixture

Identified uses Sulfur donor

1.3 Manufacturer or supplier's details

Company/Undertaking identification address Merchem Limited
Grove Centre,
44- Development Plot,
Kalamassery,
Cochin – 683 109, Kerala, India
Telephone + 91-484-4089300
Telefax + 91-484-4089310

1.4 Emergency Telephone Number

Emergency Telephone Number + 91-484-4089300

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to EU Directives 67/548/EEC or 1999/45/EC

Xi

N

R 36/37/38

R 43

EC Number: 203-103-0

Annex 1 Index Number: Nil

Classification according to Regulation (EC) No 1272/2008

Skin irritation (Category 2), H315

Eye irritation (Category 2), H319

Specific target organ toxicity - single exposure (Category 3), H335

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram





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Signal word

Warning

Hazard statement(s)

H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary statement(s) - Prevention

P261 Avoid breathing dust/ fume/ gas/ mist/ vapours/ spray.
P264 Wash skin thoroughly after handling
P272 Contaminated work clothing should not be allowed out of the workplace.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P273 Avoid release to the environment

Precautionary statement(s) –Response

P302 + P352 IF ON SKIN: wash with plenty of soap and water
P333 + P313 IF SKIN irritation or rash occurs: Get medical advice/attention.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Precautionary statements — Storage

P402 + P404 Store in a dry place. Store in a closed container.

Precautionary statements — Disposal

P501 - Dispose of contents/container to an approved incineration plant

Supplemental Hazard Statements : None

2.3 Other hazards : None

Note : For the full text of the R phrases, S phrases, and symbols mentioned in this Section, see Section 16

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances

Chemical description 4,4'-Dithiodimorpholine.

Composition/Information on ingredients

Chemical Name	CAS No.	EC No.	Annex-1 Index No.	Weight %
4,4'-Dithio di Morpholine	103-34-4	203-103-0	---	>98

3.2 Mixtures

Not applicable. Substance is not a mixture



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SECTION 4: FIRST AID MEASURES

4.1 Description of first-aid measures

- General advice** Consult a physician. Show this safety data sheet to the doctor in attendance.
- Inhalation** If breathed in, move person into fresh air. If not breathing, give artificial respiration. Consult a physician.
- Skin contact** Wash off with soap and plenty of water. Consult a physician.
- Eye contact** Rinse thoroughly with plenty of water for at least 15 minutes and consult a physician.
- Ingestion** Never give anything by mouth to an unconscious person. Rinse mouth with water. consult a physician.

4.2 Most important symptoms and effects, both acute and delayed

- Causes skin irritation
- Causes serious eye irritation.
- May cause respiratory irritation 11

4.3 Indication of any immediate medical attention and special treatment needed

5 no data available

SECTION 5: FIRE FIGHTING MEASURES

5.1 Extinguishing media

Suitable extinguishing media

Use water spray, alcohol-resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Specific hazard During a fire the product can form sulfur dioxide, nitrogen oxides, morpholine and toxic fumes.

Specific method Remove the combustible products. Hose down gases / fumes / dust with water spray. Avoid the run-off of polluted water into waterways

5.3 Protective Equipment and Precautions for Firefighters

Self contained breathing apparatus (SCBA) operating in the positive pressure mode and full fire fighting protective clothing should be worn for combating fires

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

- Use personal protective equipment.
- Avoid dust formation.
- Avoid breathing vapours, mist or gas.
- Ensure adequate ventilation.
- Evacuate personnel to safe areas.
- Avoid breathing dust.



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6.2 Environmental precautions

- Avoid dust formation and sources of ignition
- Do not let product enter drains.

6.3 Methods and materials for containment and cleaning up

- Pick up and arrange disposal without creating dust.
- Sweep up and shovel.
- Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

See section 7,8 & 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

- Avoid contact with skin and eyes
- Avoid formation of dust and aerosols.
- Provide appropriate exhaust ventilation at places where dust is formed.
- Wear personal protective equipment
- Ensure that eyewash stations and safety showers are close to the workstation location
- Wash hands after handling
- Remove contaminated clothing and protective equipment before entering eating areas

7.2 Conditions for safe storage, including any incompatibilities

- Store in cool place.
- Keep container tightly closed in a dry and well-ventilated place.
- Do not store near acids and oxidants or at high temperatures
- Use spark-proof tools and explosion-proof equipment
- Keep away from heat and sources of ignition
- Do not let the product enter into drains.
- Do not contaminate surface waters.

7.3 Specific end use(s)

A part from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: EXPOSURE CONTROL/PERSONNEL PROTECTION

8.1 Control parameters

Components with workplace control parameters

8.1 Appropriate engineering controls

Local exhaust ventilation should be provided. Local exhaust ventilation systems should be designed by a professional engineer. Provide sufficient air exchange and / or exhaust at work stations.



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8.2 Exposure controls

Personal protective equipment

Eye/face protection

Safety glasses with side-shields conforming to EN166 Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use proper glove removal technique (without touching glove's outer surface) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Body Protection

Impervious clothing, The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

Respiratory protection

For nuisance exposures use type P95 (US) or type P1 (EU EN 143) particle respirator. For higher level protection use type OV/AG/P99 (US) or type ABEK-P2 (EU EN 143) respirator cartridges. Use respirators and components tested and approved under appropriate government standards such as NIOSH (US) or CEN (EU).

Control of environmental exposure

Do not let product enter drains.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a) Appearance Form	:	solid
b) Odour	:	no data available
c) Odour Threshold	:	no data available
d) pH	:	no data available
e) Melting point/freezing point :		Melting point/range: 120 - 125 °C
f) Initial boiling point and boiling range :		no data available
g) Flash point	:	no data available
h) Evaporation rate	:	no data available
i) Flammability (solid, gas)	:	no data available
j) Upper/lower flammability or explosive limits :		no data available
k) Vapour pressure	:	no data available
l) Vapour density	:	no data available
m) Relative density	:	1,380 g/cm ³
n) Water solubility	:	235 mg/l at 25°C
o) Partition coefficient: octanol/water :		log Pow = 2.49
p) Auto-ignition temperature	:	no data available
q) Decomposition temperature :		no data available
r) Viscosity	:	no data available
s) Explosive properties	:	no data available
t) Oxidizing properties	:	no data available
u) Bulk density	:	400kg/m ³



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9.2 Other safety information

No data available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

- No data available

10.2 Chemical stability

- Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions

- No data available

10.4 Conditions to avoid

- High temperatures
- acids and oxidants

10.5 Incompatible materials

- Strong oxidizing agents
- Acids

10.6 Hazardous decomposition products

- Morpholine, nitrogen oxides, carbon dioxide and sulfur oxides.
- Risk of formation of nitrosamines with nitroso groups. Possible formation of n-nitrosomorpholine (a suspected carcinogen) with nitroso group by heat in the event of fire

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Information on toxicological effects

Acute toxicity : **Ingestion:** (oral, rat)LD50 5600 mg/Kg practically not harmful

Inhalation : no data available

Skin corrosion/irritation : (dermal, rabbit)LD50 5010 mg/Kg

Serious eye damage/eye irritation : Irritating to eyes.

Respiratory or skin sensitization : May cause sensitization by skin contact. Repeated or prolonged exposure may cause skin irritations. Risk of irritation of respiratory system

Germ cell mutagenicity : No data available

Carcinogenicity : No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.



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Reproductive toxicity : No data available

Specific target organ toxicity - single exposure : slightly irritating on skin and eyes.

Specific target organ toxicity - repeated exposure : Repeated or prolonged exposure may cause skin irritations

Human experience : slightly irritating on skin and eyes. Repeated or prolonged exposure may cause skin irritations

Additional Information : Nausea, Headache, Vomiting, To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

Fish:	Lepomis Macrochirus	: 96 hours: 1.6 mg / l
	Pimphales Promelas LC 50,:	: 96 hours: 3.5 mg/l
Daphnia	Daphnia Magna CE50,	:48 hours: 4.5 mg/l
Algae	Selenastrum Capricornutum CE50,	: 96 hours: 29 mg/l

12.2 Persistence and degradability

no data available

12.3 Bioaccumulative potential

no data available

12.4 Mobility in soil

no data available

12.5 Results of PBT and vPvB assessment

PBT/vPvB assessment not available as chemical safety assessment not required/not conducted

12.6 Other adverse effects

no data available

12.7 Other information

Do not discharge product unmonitored into the environment



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SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste Disposal Method

Waste treatment methods

Product

- Product should be disposed of in an EPA approved incinerator in accordance with all local, state, and/or federal regulations.

Contaminated packaging

- Dispose of container and unused contents in accordance with federal, state and local requirements

SECTION 14: TRANSPORT INFORMATION

14.1 Road transport (ADR/RID/ADN)

ADR/RID Class	9
UN-No	3077
Packing Group	III
Proper Shipping Name	Environmentally Hazardous substance,Solid,n.o.s(Dithio di caprolactam)

14.2 Sea transport (IMDG)

Class	9
UN-No	3077
Packing Group	III
Marine pollutant	No
Proper Shipping Name	Environmentally Hazardous substance,Solid,n.o.s(Dithio di caprolactam)

14.3 Air transport (ICAO-TI/IATA)

Class	9
UN-No	3077
Packing Group	III
Proper Shipping Name	Environmentally Hazardous substance,Solid,n.o.s(Dithio di caprolactam)

14.4 Other information

No data available

14.5 Environmental hazards

Information on environmental hazards, if relevant, pls. see 14.1 - 14.3.

14.6 Special precautions for user

No data available

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not relevant



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SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Regulation 1907/2006 REGULATION (EC) No 1272/2008

Classification according to EU directives 67/548/EEC or 1999/45/EC

15.2 Chemical Safety Assessment

For this product a chemical safety assessment was not carried out

SECTION 16: OTHER INFORMATION

Issue No.	2
Issue date date:	20.03.2015
Revision No.	0
Reason for revision	Reviewed & revamped based on the guide lines of Regulation (EC) No 1907/2006

Full text of R & S Statements and symbols referred to under sections 2 Classification of dangerous substance directive (67/548/EEC)

- Xi Irritant
- N Dangerous for the environment

List of relevant R(isk)-phrase(s)

- R36/37/38 Irritating to eyes, respiratory system and skin.
- R 43 May cause sensitization by skin contact

List of relevant S(afety) phrase(s)

- S 22 Do not breathe dust
- S 24 Avoid contact with skin
- S 26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advise
- S 37 Wear suitable gloves
- S 61 Avoid release to environment

Further information:

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 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. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release.

End of Material Safety Data Sheet