


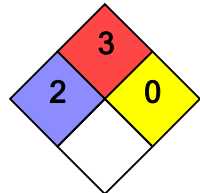
Dimethyl disulphide

Identification			
Name	Dimethyl disulphide	Reference numbers	
IUPAC name	methyldisulfanylmethane	UN number	2381
Proper shipping name	DIMETHYL DISULPHIDE	CAS number	624-92-0
Product name	Dimethyl disulphide	EINECS	210-871-0
		Index number	
Other names (more on page 11)	(Methyldithio)methan (Methyldithio)methane 2,3-DITIABUTAAN 2,3-Dithiabutan 2,3-Dithiabutane		

Reference: 2, 10, 42, 44, 162

Substance Properties	
Highly flammable colourless to yellowish liquid with characteristic odour. May form explosive mixtures. Sinker.	
Class	Flammable liquids
Main uses	Food additive, sulfiding agent in oil refineries.
Appearance	Colourless to yellowish liquid.
Odour	Disagreeable, characteristic
Behaviour (EBCS)	S - sinker



Reference: 10, 207, 235

Fire Codes			
Legend	no risk  severe risk		
Health	Blue (Left)	0 to 4	
Flammability	Red (Top)	0 to 4	
Reactivity	Yellow (Right)	0 to 4	
Special Hazards	White (Bottom)	OX means "oxidizer" W means "use no water"	

Reference: 10

Warning: Danger of ignition at ambient temperatures.

Reference: 10

Maritime transport codes					
IMDG			IBC		
UN number		2381	Marine pollution category 	Y	Category Y-Substances under MARPOL Annex II
Hazard class	3	Flammable liquids			
Subsidiary risks	-		Hazards	S/P	Safety and pollution hazards
Packing group	II	Moderate hazard	Ship type	2	Chemical tanker for products with appreciably severe environmental and safety hazards (significant preventive measures)
Emergency schedule EmS	F-E	Non-water-reactive flammable liquids	Tank type	2G	Integral gravity tank
	S-D	Flammable liquids			
Placard / label			Tank vents	Cont.	Controlled venting
			Gauging	R	Restricted gauging
			Tank environmental control	No	No special requirements
			Vapour detection	F-T	Flammable toxic vapours
			Fire protection	B	Regular foam; (not of an alcohol-resistant type, including fluoro-protein and aqueous-film-forming foam)
Stowage and segregation	Cat.B	Cargo or passenger ships with < 25 passengers or 1 passenger/3 m length - stowage on or under deck; other passenger ships with more passengers - stowage on deck only	Emergency equipment	No	No special requirements
		Clear of living quarters.			
Marine pollutant		No			

Reference: 2, 44

Dimethyl disulphide

GESAMP profile		1	2	3	4	5	6
Bioaccumulation & biodegradation	A1 Bioaccumulation	1					
	A2 Biodegradation	NR: Not readily biodegradable					
Aquatic toxicity	B1 Acute aquatic toxicity	3					
	B2 Chronic aquatic toxicity	2					
Acute mammalian toxicity	C1 Mammalian acute oral toxicity	2					
	C2 Mammalian acute dermal toxicity	0					
	C3 Mammalian acute inhalation toxicity	2					
Irritation, corrosion and long term health effects	D1 Skin irritation and corrosion	1: Mildly irritating					
	D2 Eye irritation and corrosion	1: Mildly irritating					
	D3 Long-term health effects						
Interference with other uses of the sea	E1 Tainting						
	E2 Physical effects on wildlife & benthic habitats	S: Sinking substances D: Dissolves					
	E3 Interference with coastal amenities	2					
Legend		<div> <div></div> maximum value </div> <div> <div></div> maximum value reached </div> <div> <div></div> () indicative or provisional classification </div>					

Reference: 1

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Dimethyl disulphide

Overview

Irritation of or damage to eyes, respiratory tract, lungs. Respiratory poisons in case of fire. Harmful on inhalation of vapours.

Reference: 10

CLP/GHS classification and hazard communication

GHS pictogram



Signal word

danger / warning

Hazard statements

Flam. Liq. 2	H225	Highly flammable liquid and vapour.
Acute Tox. 4	H302	Harmful if swallowed.
Eye Irr. 2	H319	Causes serious eye irritation.
Acute Tox. 3	H331	Toxic if inhaled.
STOT SE 3	H335	May cause respiratory irritation.
Aquatic Chronic 2	H411	Toxic to aquatic life with long lasting effects.

Precautionary statements

Reference: 162

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Dimethyl disulphide

Health hazards	
If swallowed	Harmful
If inhaled	Irritation, harmful.
Skin/eye contact	Irritation
Odour threshold concentration	
Toxicity	Acute toxicity: oral LD50 in rats is lower than 500 mg/kg but higher than 290 mg/kg.

Reference: 10, 162

Substance intrinsic hazards					
Fire explosion	Highly flammable liquid, may form explosive mixtures.				
Fume hazards	Vapours may form explosive mixture with air.				
Reaction with other substances					
Acids	No	Shock	No	Oxidising agents	Yes
Air	No	Fresh/sea water	No	Alkalis	No
With reducing agents	No				
With other substances					
Combustion by-products					

Reference: 10, 162

Environmental hazards	
Behaviour	Possibility of harmful mixture. Not miscible. Sinks.
Viscosity	
Eco toxicity	PNEC aqua (freshwater) 0.00175 mg/L , PNEC aqua (marine water) 0.00018 mg/L , PNEC aqua (intermittent releases) 0.0175 mg/L , PNEC STP 10 mg/L , PNEC sediment (freshwater) 0.00789 mg/kg sediment dw , PNEC soil 0.00176 mg/kg soil dw.

Reference: 10, 162

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Emergency health measures

Always consult a doctor!

Symptoms	Irritation of or damage to eyes, respiratory tract, lungs.
First aid response	
Inhalation	If difficulties occur after vapour/aerosol has been inhaled, remove to fresh air and seek medical attention.
Ingestion	Rinse mouth immediately and then drink plenty of water, seek medical attention.
Skin contact	Wash thoroughly with soap and water.
Eye contact	Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

Reference: 10

Emergency response measures on board of vessels

Response actions	<p>KEEP UNAUTHORISED PERSONNEL AWAY. STAY UPWIND. KEEP OUT OF LOW AREAS/ CONFINED SPACES. VENTILATE CLOSED SPACES BEFORE ENTERING. ALOHA Danger zone: Initial safety zone (0.2 m³ release, wind speed 1 m/s): downwind >2.5 km, 90 degrees >10 km.</p> <p>ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). All equipment used when handling the product must be grounded.</p> <p>Stop leak if you can do it without risk.</p> <p>A vapor suppressing foam may be used to reduce vapors. Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers. Use clean non-sparking tools to collect absorbed material.</p> <p>Large Spill:</p> <p>Dike far ahead of liquid spill for later disposal. Water spray may reduce vapor; but may not prevent ignition in closed spaces.</p>
In case of leakage	
In open area	Chemical binder. Cover residual quantities, place ready in closed containers. Seal off low-lying rooms. Remove ignition sources.
In confined space	Chemical binder. Cover residual quantities, place ready in closed containers. Seal off low-lying rooms. Remove ignition sources.
To water	

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

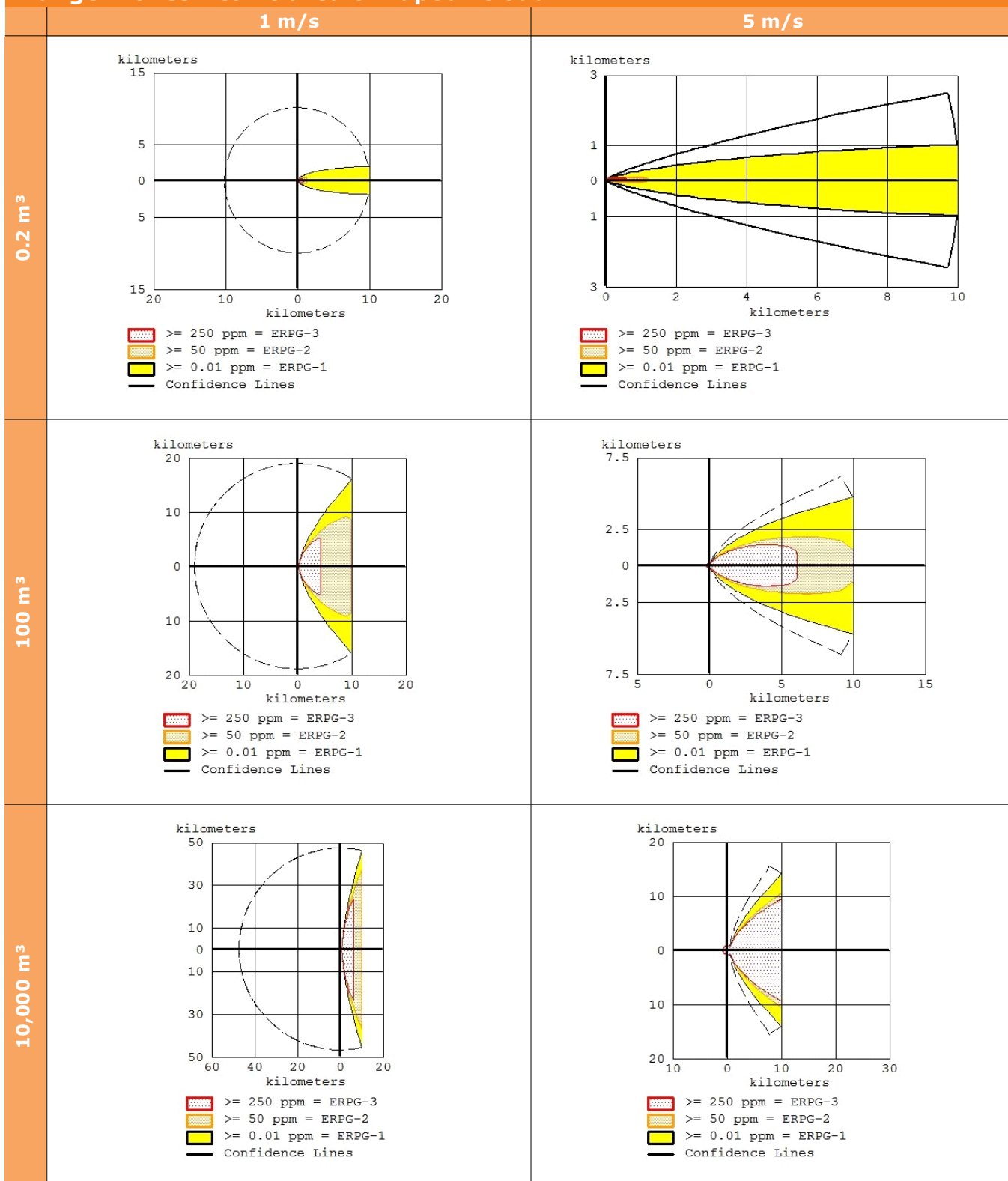
Dimethyl disulphide

Fire fighting			
Extinguishing media	Large: Alcohol-resistant foam, water spray. Small: Carbon dioxide, powder.		
Fire fighting methods	Adapt measures to surrounding fire (substance is not burning).		
Personal protective equipment	Wear a self-contained breathing apparatus.		
Decontamination of personnel on-site	Drench contaminated suit and breathing apparatus with water/detergent before removing facemask and suit. Use chemical protection suit and self contained breathing apparatus while undressing contaminated co-workers or handling contaminated equipment. Contain decontamination runoff.		
Exposure safety limit	PAC 1	PAC 2	PAC 3
	0.01 ppm	50 ppm	250 ppm
Monitoring/detection			
Emergency contacts	MAR-ICE Phone: +33 2 98 33 10 10 Fax: +33 2 98 44 91 38 +33 8 00 62 77 65 E-Mail: MAR-ICE@cedre.fr		

Reference: 10, 51, 112, 113, 162, 228

Environmental protection measures	
Intermediate storage	Keep container tightly closed and in a cool place. The packed product is not damaged by low temperatures or by frost. Protect from temperatures above: 60 °C. Suitable materials: Teflon, PVDF, CrNi steel, CrNiMo steel, glass.
Substance disposal	

Reference: 10, 162

Danger zones - toxic area of vapour cloud


Source for the calculation is the ALOHA model developed by the US EPA and NOAA. Maximum predicted impacted area is 10 km. The calculations are based on:

Location: ATLANTIC, OCEAN

Building: unsheltered single storied

Time: using computer's clock

SOURCE STRENGTH:

Direct source: 0.2 or 100 or 10,000 m³

Source height: 10 meters with spontaneous release

ATMOSPHERIC DATA:

Wind: 1 or 5 meters/second from 180° true at 10 meters

Ground roughness: open water

Air temperature: 20 °C

Inversion height: No inversion height

Cloud: no cloud

Stability class: D

Relative humidity: 50 %

Reference: 51

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Dimethyl disulphide

First case history	
Cause of the incident	
Type of cargo	
Year	
Location	
Incident description	
Response description	
Authority in charge for dealing with the incident	

Reference:

Dimethyl disulphide

Physical and chemical properties			
Structure	$\text{H}_3\text{C}-\text{S}-\text{S}-\text{CH}_3$		
Formula	C ₂ H ₆ S ₂		
Molar mass	94.19 g/mol	Vapour pressure (at 20 °C)	37 mbar
Melting point	-84.7 °C	Vapour density (air=1)	3.24
Boiling point	110 °C	Liquid surface tension (at 20 °C)	33.6 mN/m
Viscosity (at 20 °C)	0.619 mPa s	COD	
Density (at 20 °C)	1.063 g/cm ³	BOD	
Physical state (at 20 °C)	Liquid	Flammability limits in air	1.1 / 16.1 %
Auto flammability	370 °C	Flash point (ABEL closed vessel)	15 °C
Flash point (TAG closed vessel)		Decomposition temperature	390 °C
Partition coefficient log (octanol/water)	1.77	Solubility in fresh water (at 20 °C)	2.5 g/L

Reference: 10, 42, 162, 235, 241

Solubility in sea water	Temp. (°C)			
	Salinity (g/kg)	5	10	20
	0	2.55 g/L ± 1.4 %	2.51 g/L ± 1.4 %	2.47 g/L ± 3.1 %
	5	2.53 g/L ± 3.0 %	2.31 g/L ± 1.5 %	2.24 g/L ± 7.7 %
	20	2.19 g/L ± 5.8 %	2.06 g/L ± 4.6 %	2.06 g/L ± 6.2 %
	34	1.96 g/L ± 6.9 %	1.95 g/L ± 2.9 %	1.57 g/L ± 3.1 %
Note				

Reference: 250

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.

Dimethyl disulphide**Other names**

(Methyldithio)methan	
(Methyldithio)methane	
2,3-DITIABUTAAN	
2,3-Dithiabutan	
2,3-Dithiabutane	
DMDS	
Disulfure de diméthyle	
METÜÜLDISULFANÜÜLMETAAN	
Methyl Disulfide	
Methyl Disulphide	
Methyldisulfid	
Methyldithiomethan	
Methyldithiomethane	
Sulfa-hitech	

Reference: 10

Reference Annex

1	INTERNATIONAL MARITIME ORGANIZATION (Editor); IMO/FAO/UNESCO-IOC/WMO/WHO/IAEA/UN/UNEP Joint Group of Experts on the Scientific Aspects of Marine Environmental Protection (GESAMP); The Revised GESAMP Hazard Evaluation Procedure for Chemical Substances Carried by Ships; London, 2002 http://www.gesamp.org/publications/publicationsdisplaypages/rs64 http://www.imo.org/OurWork/Environment/PollutionPrevention/ChemicalPollution/Documents/GESAMP-EHSCompositelistofhazardeprofiles.pdf (15 April 2011)
2	Recommendations on the Transport of Dangerous Goods, United Nations, New York and Geneva, 2007 [with IMDG Code]
10	RESY, Gefahrstoffdatenbank der Behörde für Stadtentwicklung und Umwelt Hamburg, 2012 [Computer aided emergency response unit system]
42	ChemIndustry; http://www.chemindustry.com/apps/chemicals (15.6.2011)
44	IBC Code 2007 Edition, International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk, IMO , London, 2007; ISBN 978-92-801-4226-6
51	United States Environmental Protection Agency, Emergency Management; http://www.epa.gov/emergencies/content/cameo/aloha.htm , version 5.4.1.2
112	Protective Action Criteria (PAC) database by Advanced Technologies and Laboratories International Incorporated; http://www.atlintl.com/DOE/teels/teel/search.html (Rev. 27 - 7.5.2012)
113	European Chemical Industry Council (CEFIC), Brussels, Belgium. Emergency Response Intervention Cards (ERICards) database; http://www.ericards.net/psp/ericards.psp_search?p_lang=1 (18.2.2012)
162	European Chemicals Agency; http://apps.echa.europa.eu/registered/data/dossiers/DISS-9eb14b21-f8e7-154f-e044-00144f67d031/AGGR-b16e89bc-5fe1-4b56-af4c-96098e920b1b_DISS-9eb14b21-f8e7-154f-e044-00144f67d031.html#AGGR-b16e89bc-5fe1-4b56-af4c-96098e920b1b (12.3.2012)
207	Wikipedia; http://en.wikipedia.org/wiki/Dimethyl_disulphide (13.4.2012)
228	U. S. Department of Transportation Pipeline and Hazardous Materials Safety Administration, CANUTEC Transport Dangerous Goods Transport Canada, Secretariat for Communications and Transport Land Transport Directorate Hazardous Materials and Wastes Directorate; http://www.tc.gc.ca/media/documents/canutec-eng/ERG2012.pdf
235	GESTIS - database on hazardous substances, IFA Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung; http://gestis-en.itrust.de/nxt/gateway.dll/gestis_en/000000.xml?f=templates\$fn=default.htm\$3 . (10.8.2012)
241	ICSU Codata; http://logkow.cisti.nrc.ca/logkow/intro.html
250	Test report 12.6000W-004_1 by KIWA Control GmbH, FB Umweltanalytik (28.08.2012)

Copyright Clause

The intellectual property rights connected to the Datasheets of Chemical Substances for Marine Pollution Response shall rest exclusively with EMSA. EMSA authorises you to access and use these Datasheets and the data and information contained within these Datasheets for non-profit use only. Where any information from these Datasheets is used in any context, these EMSA Datasheets must be acknowledged as the source.

Liability Clause

EMSA will not accept any responsibility or liability whatsoever for any direct or indirect damages arising from the information collected in the Datasheets, or the use or inability to use these Datasheets.