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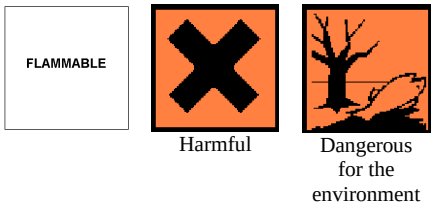
SAFETY DATA SHEET

DIMETHOATE 400 g/l EC, BLUE, STABILIZED

Revision: Sections containing a revision or new information are marked with a ♣.

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY/UNDERTAKING



Product name	**DIMETHOATE 400 g/l EC, BLUE, STABILIZED**
Intended use	Insecticide
Manufacturer	***CHEMINOVA A/S*** P.O. Box 9 DK-7620 Lemvig Denmark sds@cheminova.dk
Telephone	(+45) 97 83 53 53 (24 h; only for emergencies)

2. ♣ HAZARDS IDENTIFICATION

2.1. CLASSIFICATION

EU classification of the product .... R10 Xn;R20/22 R43 N;R51/53; see 15.1.
In accordance with Reg. 1907/2006

WHO classification ..... Class II: Moderately hazardous

GHS classification .....
(according to UN edition 2005)

Flammable liquid: Category 3
Acute oral toxicity: Category 4
Inhalation toxicity: Category 4
Sensitisation – skin: Category 1
Aspiration: Category 2
Hazards to the aquatic environment: Category Chronic 2

2.2. Health hazards (acute and chronic)

The product is harmful by inhalation and by skin contact. It may be mildly to moderately irritating to skin and eyes.

A similar product was found to be an allergic sensitiser in animal tests.

The active ingredient **dimethoate** is a poison (cholinesterase inhibitor). It rapidly enters the body on contact with all skin surfaces and eyes.

Repeated exposures to cholinesterase inhibitors such as **dimethoate** may, without warning, cause increased susceptibility to doses of any cholinesterase inhibitor.

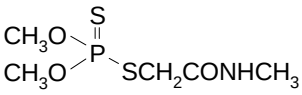
2.3. Signs and symptoms of exposure — Allergic reactions. Symptoms of cholinesterase inhibition: nausea, headache, vomiting, cramps, weakness, blurred vision, pin-point pupils, tightness in chest, laboured breathing, nervousness, sweating, watering of eyes, drooling or frothing of mouth and nose, muscle spasms and coma.

2.4. Environmental hazards ..... The product is toxic to aquatic organisms. See section 12.

2.5. Other hazards ..... The product is flammable.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1. **ACTIVE INGREDIENT** ..... **DIMETHOATE**

CAS name	Phosphorodithioic acid, O,O-dimethyl S-[2-(methylamino)-2-oxoethyl] ester
CAS no.	60-51-5
IUPAC name	O,O-Dimethyl S-methylcarbamoylmethyl phosphorodithioate
Other name(s)	O,O-Dimethyl S-(N-methylcarbamoylmethyl) phosphorodithioate
ISO name/EU name	Dimethoate
EC no. (EINECS no.)	200-480-3
EU index no.	015-051-00-4
EU classification of the ingredient	Xn;R21/22; see section 16.
Structural formula	

3.2. **COMPOSITION**

Active ingredient	Dimethoate Technical	39% by weight
Other ingredients	Cyclohexanone	43% by weight
	Xylene	12% by weight
	Emulsifiers, etc.	6% by weight
Reportable ingredients	Cyclohexanone	43% by weight

CAS no.: 108-94-1, EC no. (EINECS no.): 203-631-1
EU classification: R10 Xn;R20; see section 16.

Xylene ..... 12% by weight
Cas no.: 1330-20-7, EC no. (EINECS no.): 215-535-7
EU classification: R10 Xn;R20/21 Xi;R38; see section 16.

4. FIRST AID MEASURES

4.1. Emergency and first aid procedures

General ..... In case of exposure do not wait for symptoms to develop. Immediately start the recommended procedures below and when any of the signs of exposure occurs, call a doctor (physician), clinic or hospital immediately. Explain that the victim has been exposed to **dimethoate**, an organophosphorus insecticide, and describe his/her condition and the extent of exposure. Immediately remove the exposed person from the area where the product is present.

Clothing contaminated with material must be removed immediately and all skin washed thoroughly.

If breathing has stopped, immediately start artificial respiration and maintain until a physician takes charge of the exposed person.

In an industrial setting the antidote atropine sulphate should be available at the workplace.

Inhalation ..... If experiencing any discomfort, immediately remove the exposed person from exposure. Get medical attention immediately if any symptom develops.

Ingestion ..... Call a doctor or get medical attention immediately. Make the exposed person rinse mouth and then drink 1 or 2 glasses of water or milk. Induce vomiting only if:
1. A significant amount (more than a mouthful) has been ingested
2. Patient is fully conscious
3. Medical aid is not readily available
4. Time since ingestion is less than one hour.
Let the patient induce vomiting by touching the back of the throat with a finger. If vomiting occurs, let him/her rinse mouth and drink fluids again.

Skin contact ..... Immediately flush with plenty of water while removing contaminated clothing and footwear. Wash with water and soap. See physician immediately if symptoms develop.

Eye contact ..... Immediately flush with plenty of water or eyewash solution, occasionally opening eyelids, until no evidence of chemical remains. Remove contact lenses after a few minutes and flush again. See physician if any discomfort develops.

4.2. Note to physician ..... **Dimethoate** is a cholinesterase inhibitor affecting the central and peripheral nervous systems producing respiratory depression.

The product contains petroleum distillates which may pose an aspiration pneumonia hazard.

Cholinesterase inhibition – treatment Decontamination procedures such as whole body washing, gastric lavage and administration of activated charcoal are often required.

Antidote: If symptoms (see 2.3.) are present, administer atropine sulphate, which often is a lifesaving antidote, in large doses, TWO to FOUR mg intravenously or intramuscularly as soon as possible. Repeat at 5 to 10 minute intervals until signs of atropinisation appear and maintain full atropinisation until all organophosphate is metabolised.

Obidoxime chloride (Toxogonin), alternatively pralidoxime chloride (2-PAM), may be administered as an adjunct to, but not a substitute for atropine sulphate. Treatment with oxime should be maintained as long as atropine sulphate is administered.

At first sign of pulmonary oedema the patient should be given supplementary oxygen and treated symptomatically.

Relapse can occur after initial improvement.
VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS, DEPENDING ON THE SEVERITY OF POISONING.

5. FIRE-FIGHTING MEASURES

5.1.	Extinguishing media and procedure	Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Use water spray to keep fire-exposed containers cool. Approach fire from upwind to avoid hazardous vapours and toxic decomposition products. Fight fire from protected location or maximum possible distance. Avoid heavy hose streams. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.
5.2.	Hazardous decomposition products in a fire	The essential breakdown products are volatile, malodorous, toxic, irritant and inflammable compounds such as hydrogen sulphide, dimethyl sulphide, methyl mercaptan, sulphur dioxide, carbon monoxide, carbon dioxide, nitrogen oxides and phosphorus pentoxide.
5.3.	Unusual fire and explosion hazards	See 10.1.

6. ACCIDENTAL RELEASE MEASURES

6.1.	Personal protection	Observe all protection and safety precautions when cleaning up spills. Depending on the magnitude of the spill this may mean wearing eye protection or face mask, respirator, gloves, chemical resistant clothing and boots. See section 8, Personal protection.
6.2.	Steps to be taken in case of spill	It is recommended to have a predetermined plan for the handling of spills. Empty, closable vessels for the collection of spills should be available. Stop the source of the spill immediately if safe to do so. Contain the spill to prevent any further contamination of surface, soil or water. Remove sources of ignition. Reduce and avoid formation of aerosol or mist as much as possible. Keep unprotected persons away from the spill area. Spills on the floor or other impervious surface should be contained or diked and then absorbed onto an absorptive material such as universal binder, hydrated lime, Fuller's earth or other absorbent clays. Collect the contaminated absorbent in suitable containers. Rinse area with soda lye and water. Absorb wash liquid with absorbent and transfer to suitable containers. Wash waters must be prevented from entering surface water drains. Large spills which soak into the ground should be dug up and transferred to suitable containers.

Spills in water should be contained as much as possible by isolation of the contaminated water. The contaminated water must be collected and removed for treatment or disposal. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body.

The used containers should be properly closed and labelled. Refer to section 13 for disposal.

7. HANDLING AND STORAGE

7.1. Precautions to be taken in handling

In an industrial environment it is recommended to avoid all personal contact with the product, if possible by using closed systems and remote system control. Otherwise the material should preferably be handled by mechanical means. Adequate ventilation or local exhaust ventilation is required. The exhaust gases should be filtered or treated otherwise. For personal protection in this situation, see section 8.

For its use as a pesticide, first look for precautions and personal protection measures on the officially approved label on the packaging or for other official guidance or policy in force. If these are lacking, see section 8.

7.2. Precautions to be taken in storing

The product is stable when stored at temperatures not exceeding 25°C.

The product should never be heated above 35°C and also local heating above this temperature should be avoided. See 10.1.

Store in closed, labelled containers. The storage room should be constructed of incombustible material, closed, dry, ventilated and with impermeable floor, without access of unauthorised persons or children. The room should exclusively be used for storage of chemicals and especially foodstuffs, drinks, feed or seed should not be present. A warning sign reading “POISON” is recommended.

7.3. Specific use .....

The product is a registered pesticide which may only be used for the applications it is registered for, in accordance with a label approved by the regulatory authorities.

7.4. Fire and explosion precautions .....

The product is flammable. Formation of explosive vapour-air mixtures is possible. Fire prevention measures should be taken. Take measures against electrostatic discharges. Keep away from sources of ignition and protect from exposure to fire and heat.

8. ♣ EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Exposure limits

		Year	
Dimethoate	OSHA (USA) PEL	2007	Not established
	ACGIH (USA) TLV	2007	Not established; BEI
	EU, 2000/39/EC	2000	Not established
	Germany, MAK	2007	Not established; BAT
	HSE (UK) WEL	2005	Not established

Cyclo-hexanone	OSHA (USA) PEL	2007	TWA 50 ppm (200 mg/m^3)
	ACGIH (USA) TLV	2007	TWA 25 ppm (100 mg/m^3); skin notation; BEI
	EU, 2000/39/EC as amended	2000	8-hr TWA 10 ppm (40.8 mg/m^3) Peak level 20 ppm (81.6 mg/m^3); max. duration 15 min. Skin notation
	Germany, MAK	2007	Skin notation; EKA
	HSE (UK) WEL	2005	8-hr TWA 10 ppm STEL 20 ppm; 15-minute reference period Skin notation; BMGV
Xylene	OSHA (USA) PEL	2007	TWA 100 ppm (435 mg/m^3)
	ACGIH (USA) TLV	2007	TWA 100 ppm (434 mg/m^3) STEL/CEIL(C) 150 ppm (651 mg/m^3) BEI
	EU, 2000/39/EC as amended	2000	8-hr TWA 50 ppm (221 mg/m^3) Peak level 100 ppm (442 mg/m^3); max. duration 15 min. Skin notation
	Germany, MAK	2007	TWA 100 ppm (440 mg/m^3); peak level 200 ppm (880 mg/m^3) Skin notation; BAT
	HSE (UK) WEL	2005	8-hr TWA 50 ppm (220 mg/m^3) STEL 100 ppm (441 mg/m^3); 15-minute reference period Skin notation; BMGV

However, other threshold limit values may be defined by local regulations and must be observed.

8.2. Personal protection .....

When used in a closed system, personal protection equipment will not be required. The following is meant for other situations, when the use of a closed system is not possible, or when it is necessary to open the system. Consider the need to render equipment or piping systems non-hazardous before opening.

Respiratory protection

In the event of discharge of the material during manufacturing or handling which produces a vapour or mist, workers should put on officially approved respiratory protection equipment with a universal filter type including particle filter.

Protective gloves .....

Wear chemical resistant gloves, such as barrier laminate, butyl rubber, nitrile rubber or viton. The breakthrough times of these materials for the product are unknown. Generally, however, the use of protective gloves will give only partial protection against dermal exposure. Small tears in the gloves and cross-contamination can easily occur. It is recommended to shift the gloves frequently and to limit the work to be done manually.

Eye protection .....

Wear safety glasses. It is recommended to have an eye wash fountain immediately available in the workplace.

Other protection .....

Wear water-proof pants, coat, hat, rubber boots or rubber overshoes.

8.3.	Work/hygienic practices	Persons working with this product for a longer period should have frequent blood tests of their cholinesterase levels. If the cholinesterase level falls below a critical point, no further exposure should be allowed until it has been determined by means of blood tests that the cholinesterase level has returned to normal. Keep all unprotected persons and children away from working area. Avoid contact with eyes, skin or clothing. Avoid breathing vapour or spray mist. Remove contaminated clothing immediately. Wash thoroughly after handling. Before removing gloves, wash them with water and soap. After work, take off all work clothes and footwear. Take a shower, using water and soap. Wear only clean clothes when leaving job. Wash protective clothing and protective equipment with water and soap after each use.
8.4.	Environmental exposure controls	Do not discharge to the environment. See section 13.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1.	Physical state	Liquid
9.2.	Colour	Blue
9.3.	Odour	Faint mercaptanic/acetone odour
9.4.	Melting point	Below 5°C
9.5.	Boiling point	**Dimethoate** : Decomposes 117°C at 0.1 mm Hg **Cyclohexanone** : 156°C **Xylene** : 140°C
9.6.	Specific gravity	1.056 g/ml at 20°C
9.7.	Vapour pressure	**Dimethoate** : 1.85×10^{-6} mm Hg at 25°C **Cyclohexanone** : 3.5 mm Hg at 20°C **Xylene** : 3.9 mm Hg at 20°C
9.8.	Viscosity	5.5 cP at 22°C
9.9.	Surface tension	35 mN/m at 22°C
9.10.	Solubility in water.....	The product is emulsifiable in water. **Dimethoate** : 39.8 g/l at 25°C **Cyclohexanone** : 50 g/l at 30°C
9.11.	Solubility in organic solvents	**Dimethoate** : 159 g/100 ml at 25°C in methanol 142 g/100 ml at 25°C in acetonitrile 122 g/100 ml at 25°C in cyclohexanone 120 g/100 ml at 25°C in isopropanol 103 g/100 ml at 25°C in toluene 31.3 g/100 ml at 25°C in xylenes
9.12.	Partition coefficient n-octanol/water	**Dimethoate** : Log P_{ow} = 0.704 **Cyclohexanone** : Log P_{ow} = 0.86 at 25°C **Xylene** : Log P_{ow} = 2.77-3.15
9.13.	pH	3.12 (1 % aqueous solution at 25°C)
9.14.	Flash point	39°C (Pensky-Martens closed cup test)
9.15.	Autoignition temperature	**Dimethoate** : 314°C **Cyclohexanone** : 420°C **Xylene** : 465-525°C
9.16.	Flammable limits	**Cyclohexanone** : 1.1-9.4 vol% **Xylene** : 1.3-9.4 vol%
9.17.	Explosive properties	Not explosive
9.18.	Oxidising properties	Not oxidising

10. STABILITY AND REACTIVITY

10.1. Thermal decomposition .....

The product (**dimethoate**) may decompose rapidly when heated, which can result in explosion. It is recommended never to heat the product above 35°C. Direct local heating such as electric heating or by steam must be avoided.

The decomposition is to a considerable extent dependent on time as well as temperature due to self-accelerating exothermic and autocatalytic reactions. The reactions involve rearrangements and polymerisation releasing volatile malodorous and inflammable compounds such as dimethyl sulphide and methyl mercaptan.

10.2. Hazardous decomposition products

See 5.2.

10.3. Materials to avoid .....

Strong alkalis and strong oxidising compounds. The product can corrode iron, steel, tin plate and copper. **Dimethoate** is rapidly hydrolysed at pH >8.

11. ♣ TOXICOLOGICAL INFORMATION

11.1. Toxicokinetics, metabolism and distribution

Dimethoate is rapidly absorbed and excreted following oral administration. There is no evidence for accumulation; it is extensively metabolised. Dimethoate and its metabolites were primarily found in the liver and kidneys.

11.2. Acute toxicity .....

The product is harmful by inhalation and ingestion, but is considered as less harmful by skin contact. The acute toxicity, based on measurements on a similar product, is estimated to be:

Route(s) of entry	- ingestion	LD_{50}, oral, rat	300-500 mg/kg
	- skin	LD_{50}, dermal, rat	> 2000 mg/kg
	- inhalation	LC_{50}, inhalation, rat	3 mg/l/4 h

11.3. Irritancy .....

The product is mildly to moderately irritating to eyes and skin. It may be irritating by other routes of exposure as well.

11.4. Allergic sensitisation .....

A similar product was found to be an allergic sensitiser in animal tests.

11.5. Carcinogenicity .....

No carcinogenic effects are observed for **dimethoate**.

11.6. Effects on reproduction .....

No effects on fertility are found for **dimethoate** at maternal non-toxic doses.

11.7. Teratogenicity .....

No teratogenic (birth defects causing) effects are found for **dimethoate**.

11.8. Mutagenicity .....

Dimethoate is mutagenic in bacterial tests, but not in mammalian cells or in *in vivo* tests.

12. ♣ ECOLOGICAL INFORMATION

12.1. Ecotoxicity .....

The product is toxic to aquatic invertebrates and highly toxic to insects. It is harmful to fish, but it is less harmful to aquatic plants, birds, earthworms, soil macro- and microorganisms.
The acute ecotoxicity measured on a similar product is:

- Fish	Rainbow trout (*Salmo gairdneri*)	96-h LC_{50}: 61.3 mg/l
	Bluegill sunfish (*Lepomis macrochirus*)	96-h LC_{50}: 44 mg/l
- Invertebrates	Daphnids (*Daphnia magna*)	48-h EC_{50}: 5.44 mg/l

- Algae	Green algae (*Selenastrum capricornutum*)	72-h IC_{50}: 233 mg/l
- Earthworms	*Eisenia foetida foetida*	14-day LC_{50}: 217.1 mg/kg dry soil

12.2. Mobility ..... **Dimethoate** has a potentially high mobility in soil, but is relatively unstable. Degradation products are not mobile in soil. **Cyclohexanone** has a high mobility in the environment. **Xylene** is not mobile in the environment.

12.3. Persistence and degradability ..... The active ingredient **dimethoate** is biodegradable. It undergoes degradation in the environment and in waste water treatment plants. No adverse effects are found at concentrations up to 100 mg/l in waste water treatment plants. Degradation occurs both aerobically and anaerobically, biologically as well as abiologically.

In aerobic soil and water **dimethoate** degrades rapidly, with half-lives of a few days. pH has a major influence. Degradation will increase at higher pH. Degradation products are not considered as harmful to soil dwelling or aquatic organisms and are mineralised relatively rapidly.

Cyclohexanone and **xylene** are readily biodegradable.

12.4. Bioaccumulative potential ..... The active ingredient dimethoate does not bioaccumulate; it is rapidly metabolised and excreted. **Cyclohexanone** is not expected to bioaccumulate. If continuous exposure is maintained, **xylene** has a potential to bioaccumulate.

13. DISPOSAL CONSIDERATIONS

13.1. Waste disposal method ..... Left-over material can be removed by controlled discharge to a waste water treatment plant. Other possible methods of disposal are controlled incineration with flue gas scrubbing or removal to a licensed chemical destruction plant.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

Dimethoate is rapidly hydrolysed at pH > 8.0.

13.2. Container disposal ..... Triple rinse (or equivalent) and offer for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill.

Disposal of waste and packagings must always be in accordance with all applicable local regulations.

14. TRANSPORT INFORMATION

ADR/RID CLASSIFICATION

Proper shipping name	Flammable liquid, n.o.s. (Cyclohexanone, xylene and dimethoate)
Class	3
UN no.	1993
Packaging group	III

IMDG CLASSIFICATION

Proper shipping name	Flammable liquid, n.o.s. (Cyclohexanone, xylene and dimethoate)
Class	3
UN no.	1993
Packaging group	III
Marine pollutant (P/PP)	Marine pollutant

IATA/ICAO CLASSIFICATION

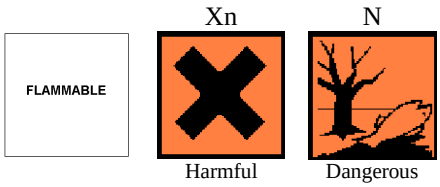
Proper shipping name	Flammable liquid, n.o.s. (Cyclohexanone, xylene and dimethoate)
Class	3
UN no.	1993
Pacakging group	III

15. REGULATORY INFORMATION

15.1. **IN THE EU**

Classification and labelling
In accordance with Reg. 1907/2006

Hazard symbols .....



Harmful

Dangerous for the environment

Contains ..... **Dimethoate, xylene and cyclohexanone**

R-phrases ..... R10-20/22-43-51/53: Flammable. Harmful by inhalation and if swallowed. May cause sensitisation by skin contact. Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S-phrases ..... S24-36/37-61 Avoid contact with skin. Wear suitable protective clothing and gloves. Avoid release to the environment. Refer to special instructions/safety data sheets.

Other mentions ..... To avoid risks to man and the environment, comply with the instructions of use.

15.2. Regulatory status ..... All ingredients in this product are covered by EU chemical legislation.

15.3. **GLOBALLY HARMONISED SYSTEM**

GHS classification .....
(according to UN edition 2005)

Flammable liquid: Category 3
Acute oral toxicity: Category 4
Inhalation toxicity: Category 4
Sensitisation – skin: Category 1
Aspiration: Category 1
Hazards to the aquatic environment: Category Chronic 2

Labelling

Product identifier ..... Dimethoate 400 g/l EC, Blue, Stabilized

Contains ..... Dimethoate, xylene and cyclohexanone

Proper shipping name ..... Flammable liquid, n.o.s. (Cyclohexanone, xylene and dimethoate)

Hazard symbols required on label

Signal word ..... Warning

Hazard statements ..... Flammable liquid and vapour
Harmful if swallowed
Harmful if inhaled
May cause an allergic skin reaction
May be fatal if swallowed and enters airways
Toxic to aquatic life with long lasting effects

Precautionary statements

Prevention ..... Keep container tightly closed.
Keep away from flames and hot surfaces – No smoking.
Wear protective gloves and eye protection.
Ground container and receiving equipment.
Use explosive-proof electrical equipment.
Take precautionary measures against static discharge.
Use only non-sparking tools.
Do not eat, drink or smoke when using this product.
Wash hands thoroughly after handling.
Use only outdoors or in a well-ventilated area.
Avoid breathing vapours.
Contaminated work clothing should not be allowed out of the workplace.
Avoid release to the environment.

Response ..... Immediately call a POISON CENTER or physician if you feel unwell.
IF ON SKIN (or hair): Remove immediately all contaminated clothing. Wash with plenty of soap and water.
If skin irritation or rash occurs, seek medical advice/attention.
Wash contaminated clothing before reuse.
IF SWALLOWED: Rinse mouth.
IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

Storage ..... Store locked up in cool/well-ventilated place.

Disposal ..... Dispose of contents/container in accordance with local regulations.

16. OTHER INFORMATION

Used R-phrases	R10	Flammable.
	R20	Harmful by inhalation.
	R20/21	Harmful by inhalation and in contact with skin.
	R20/22	Harmful by inhalation and if swallowed.
	R21/22	Harmful in contact with skin and if swallowed.
	R38	Irritating to skin.
	R43	May cause sensitisation by skin contact.
	R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

This material should only be used by persons who are made aware of its hazardous properties and have been instructed in the required safety precautions.

The information provided in this safety data sheet is believed to be accurate and reliable, but uses of the product vary and situations unforeseen by Cheminova A/S may exist. The user of the material has to check the validity of the information under local circumstances.