

Material group	3621-04	Page 1 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019
Safety data sheet according to EU Reg. 1907/2006 as amended		Supersedes March 2018

SAFETY DATA SHEET

3621-04, DIMETHOATE 400 g/l EC

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

♣ SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

- 1.1. **Product identifier** **3621-04, Dimethoate 400 g/l EC**
Contains dimethoate, cyclohexanone, hydrocarbons, C9, aromatics and maleic anhydride
- 1.2. **Relevant identified uses of the substance or mixture and uses advised against** Can be used as insecticide only.
- 1.3. **Details of the supplier of the safety data sheet** **CHEMINOVA A/S**, a subsidiary of FMC Corporation
 Thyborønvej 78
 DK-7673 Harbøre
 Denmark
SDS.Ronland@fmc.com
- 1.4. **Emergency telephone number**
Company +45 97 83 53 53 (24 h; for emergencies only)
- Medical emergencies:
- | | |
|-------------------------------------|---|
| Austria: +43 1 406 43 43 | Luxembourg: +352 8002 5500 |
| Belgium: +32 70 245 245 | Netherlands: +31 30 274 88 88 |
| Bulgaria: +359 2 9154 409 | Norway: +47 22 591300 |
| Cyprus: 1401 | Poland: +48 22 619 66 54 |
| Czech Republic: +420 224 919 293 | +48 22 619 08 97 |
| +420 224 915 402 | Portugal: 808 250 143 (in Portugal only) |
| Denmark: +45 82 12 12 12 | +351 21 330 3284 |
| England and Wales: 111 | Romania: +40 21318 3606 |
| Estonia: +372 7943500 | Scotland: +8454 24 24 24 |
| France: +33 (0) 1 45 42 59 59 | Slovakia: +421 2 54 77 4 166 |
| Finland: +358 9 471 977 | Slovenia: +386 41 650 500 |
| Greece: 30 210 77 93 777 | South Africa: +27 83 123 3911 (Bateleur Emergency Response Co.) |
| Hungary: +36 80 20 11 99 | Spain: +34 91 562 04 20 |
| Ireland (Republic): +353 1 837 9964 | Sweden: +46 08-331231 |
| Italy: +39 02 6610 1029 | 112 |
| Latvia: +371 670 42 473 | Switzerland: 145 |
| 112 | Turkey: 114 |
| Lithuania: +370 523 62052 | U.S.A. & Canada: +1 800 / 331 3148 |
| +370 687 53378 | All other countries: +1 651 / 632 6793 (Collect) |

Material group	3621-04	Page 2 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

Flammable liquid: Category 3 (H226)
 Acute oral toxicity: Category 4 (H302)
 Acute inhalation toxicity: Category 4 (H332)
 Eye irritation: Category 2 (H319)
 Sensitisation – skin: Category 1B (H317)
 Aspiration toxicity: Category 1 (H304)
 Hazards to the aquatic environment, chronic: Category 1 (H410)

WHO classification Class II: Moderately hazardous

Physicochemical hazards The product is flammable.

Health hazards The product is harmful by inhalation and by ingestion. It may be mildly to moderately irritating to skin and eyes. It may cause sensitivity by skin contact.

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.

Environmental hazards The product is toxic to aquatic organisms.

2.2. Label elements

According to EU Reg. 1272/2008 as amended

Product identifier 3621-04, Dimethoate 400 g/l EC
 Contains dimethoate, cyclohexanone, hydrocarbons, C9, aromatics and maleic anhydride

Hazard pictograms (GHS02, GHS07, GHS08, GHS09)



Signal word Danger

Hazard statements

H226 Flammable liquid and vapour.
 H302 Harmful if swallowed.
 H304 May be fatal if swallowed and enters airways.
 H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H332 Harmful if inhaled.
 H410 Very toxic to aquatic life with long lasting effects.

Material group	3621-04	Page 3 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

Supplementary hazard statement EUH401	To avoid risks to human health and the environment, comply with the instructions of use.
Precautionary statements	
P261	Avoid breathing vapours.
P280	Wear protective gloves and eye/face protection.
P303+P361+P352	IF ON SKIN (or hair): Remove immediately all contaminated clothing. Wash with plenty of soap and water.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.
P501	Dispose of contents/container as hazardous waste.
2.3. Other hazards	None of the ingredients in the product meets the criteria for being PBT or vPvB.

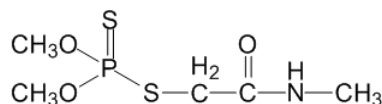
SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances	The product is a mixture, not a substance.
3.2. Mixtures	See section 16 for full text of hazard statements.

Active ingredient

Dimethoate	Content: 39% by weight
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
Classification of the ingredient	(* = Harmonised classification) Self-reactive substance Type F (H242) Acute oral toxicity: Category 4 (H302) * Acute dermal toxicity: Category 4 (H312) * Acute inhalation toxicity: Category 4 (H332) Hazards to the aquatic environment, chronic: Category 1 (H410)

Structural formula



Reportable ingredients

	Content (% w/w)	CAS no.	EC no.	Classification
Cyclohexanone Reg. no. 01-2119453616-35	48	108-94-1	EINECS no.: 203-631-1	Flam. Liq. 3 (H226) Acute Tox. 4 (H332)

Material group	3621-04	Page 4 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

Hydrocarbons, C9, aromatics Reg. no. 01-2119455851-35	8	918-668-5	Flam. Liq. 3 (H226) STOT SE 3 (H335) STOT SE 3 (H336) Asp. Tox. 1 (H304) Aquatic Chronic 2 (H411)
Maleic anhydride Reg. no. 01-2119472428-31	0.1 - 1	108-31-6	EINECS no.: 203-571-6 Acute Tox. 4 (H302) Skin Corr. 1B (H314) Resp. Sens. 1 (H334) Skin Sens. 1 (H317)

SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

If exposure has occurred, do not wait for symptoms to develop, but immediately start the procedures described below.

Inhalation

If experiencing any discomfort, immediately remove from exposure. Light cases: Keep person under surveillance. Get medical attention immediately if symptoms develop. Serious cases: Get medical attention immediately or call for an ambulance.

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

Skin contact

Immediately remove contaminated clothing and footwear. Flush skin with water. Wash with water and soap. See physician immediately if symptoms develop.

Eye contact

Immediately rinse eyes with much water or eyewash solution, occasionally opening eyelids, until no evidence of chemical remains. Remove contact lenses after a few minutes and rinse again. See physician immediately.

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, take care that vomit does not enter airways. Let the exposed person rinse mouth and drink fluids again.

4.2. Most important symptoms and effects, both acute and delayed

On contact, the first symptoms to appear may be irritation. 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.

Material group	3621-04	Page 5 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

4.3. Indication of any immediate medical attention and special treatment needed

If any of the signs of cholinesterase inhibition occurs, call a doctor (physician), clinic or hospital immediately. Explain that the victim has been exposed to **dimethoate**, an organophosphorus insecticide. Describe his/her condition and the extent of exposure. Immediately remove the exposed person from the area where the product is present.

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

It may be helpful to show this safety data sheet to physician.

Notes 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

Much information on (acetyl)cholinesterase inhibition by organophosphate insecticides and its treatment can be found on the internet.

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

Antidote: If symptoms (see subsection 4.2.) 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.

Especially in the case of dimethoate, treatment with atropine sulphate is essential. Results of treatment with oxime for dimethoate poisoning are notoriously varying and it may happen that oxime doesn't have any positive effect. In no case should oxime be used instead of atropine sulphate.

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.

Material group	3621-04	Page 6 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

SECTION 5: FIRE-FIGHTING MEASURES

- 5.1. **Extinguishing media** Dry chemical or carbon dioxide for small fires, water spray or foam for large fires. Avoid heavy hose streams.
- 5.2. **Special hazards arising from the substance or mixture** 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.
- The product (**dimethoate**) may decompose rapidly when heated, which can result in explosion.
- 5.3. **Advice for firefighters** 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. Dike area to prevent water runoff. Firemen should wear self-contained breathing apparatus and protective clothing.

SECTION 6: ACCIDENTAL RELEASE MEASURES

- 6.1. **Personal precautions, protective equipment and emergency procedures** It is recommended to have a predetermined plan for the handling of spills. Empty, sealable vessels for the collection of spills should be available.
- In case of large spill (involving 10 tonnes of the product or more):
1. use personal protection equipment; see section 8
 2. call emergency telephone no.; see section 1
 3. alert authorities.
- Observe all safety precautions when cleaning up spills. Use personal protection equipment. Depending on the magnitude of the spill this may mean wearing respirator, face mask or eye protection, chemical resistant clothing, gloves and boots.
- Stop the source of the spill immediately if safe to do so. Keep unprotected persons away from the spill area. Remove sources of ignition. Avoid and reduce mist formation as much as possible.
- 6.2. **Environmental precautions** Contain the spill to prevent any further contamination of surface, soil or water. Wash waters must be prevented from entering surface water drains. Uncontrolled discharge into water courses must be alerted to the appropriate regulatory body.
- 6.3. **Methods and materials for containment and cleaning up** It is recommended to consider possibilities to prevent damaging effects of spills, such as bunding or capping. See GHS (Annex 4, Section 6).
- Use non-sparking tools and equipment. If appropriate, surface water drains should be covered. Minor spills on the floor or other

Material group	3621-04	Page 7 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

impervious surface should be 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. Clean area with soda lye and much water. Absorb wash liquid with absorbent and transfer to suitable containers. The used containers should be properly closed and labelled.

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.

- 6.4. **Reference to other sections** See subsection 7.1. for fire prevention.
 See subsection 8.2. for personal protection.
 See section 13 for disposal.

SECTION 7: HANDLING AND STORAGE

- 7.1. **Precautions for safe handling** The product is flammable. Formation of explosive vapour-air mixtures is possible. Fire prevention measures should be taken. Keep away from sources of ignition and protect from exposure to fire and heat. Take precautions against static discharge.
- If the temperature of the liquid is below 38°C, which is 10°C below its flash point of 48°C, the fire and explosion hazard is considered minor. At higher temperatures, the hazard gradually becomes more serious.
- In an industrial environment, it is important to avoid all personal contact with the product, if possible by using closed systems with remote system control. The material should be handled by mechanical means as much as possible. 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.
- Keep all unprotected persons and children away from working area.
- 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.

Material group	3621-04	Page 8 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

Inhalation of vapours of the product can cause lowered consciousness, which increases the risks of operating machinery and driving.

Do not discharge to the environment. Do not contaminate water when disposing of equipment wash waters. Collect all waste material and remains from cleaning equipment, etc., and dispose of as hazardous waste. See section 13 for disposal.

7.2. Conditions for safe storage, including any incompatibilities

The product is stable when stored at temperatures not exceeding 25°C. Protect against strong heat from sunshine or other source, e.g. fire.

At low temperatures formation of crystals may occur.

The product should never be heated above 35°C and also local heating above this temperature should be avoided. See subsection 10.2.

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. A warning sign reading "POISON" is recommended. The room should only be used for storage of chemicals. Food, drink, feed and seed should not be present. A hand wash station should be available.

7.3. Specific end use(s)

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.

♣ SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Personal exposure limits

		Year	
Dimethoate	ACGIH (USA) TLV	2015	Not established; BEI
	OSHA (USA) PEL	2015	Not established
	EU, 2000/39/EC as amended	2017	Not established
	Germany, MAK	2014	Not established; BAT
	HSE (UK) WEL	2011	Not established
Cyclo-hexanone	ACGIH (USA) TLV	2015	TWA 20 ppm STEL 50 ppm Skin notation
	OSHA (USA) PEL	2015	TWA 50 ppm (200 mg/m ³)
	EU, 2000/39/EC as amended	2017	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	2014	Skin notation; EKA

Material group	3621-04	Page 9 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

HSE (UK) WEL	2011 8-hr TWA 10 ppm (41 mg/m ³) STEL 20 ppm (82 mg/m ³); 15-minute reference period Skin notation; BMGV
Aromatic hydrocarbons	100 ppm total hydrocarbon is recommended. The mixture contains trimethyl benzene. The ACGIH recommends a TLV-TWA of 25 ppm (123 g/m ³) for trimethyl benzene. However, other personal exposure limits defined by local regulations may exist and must be observed.
Monitoring methods	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.
Dimethoate	
DNEL, dermal	Not established
PNEC, aquatic environment	EFSA has established an AOEL of 0.001 mg/kg bw/day 0.0008 mg/l
Cyclohexanone	
DNEL, dermal	10 mg/kg bw/day
DNEL, inhalation	100 mg/m ³
PNEC, aquatic environment	0.0329 mg/l
Aromatic hydrocarbons	
DNEL, dermal	25 mg/kg bw/day
DNEL, inhalation	150 mg/m ³
PNEC, aquatic environment	Not applicable
8.2. Exposure controls	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. The precautions mentioned below are primarily meant for handling of the undiluted product and for preparing the spray solution, but can be recommended for spraying as well. In cases of incidental high exposure, maximal personal protection may be necessary, such as respirator, face mask, chemical resistant coveralls.



Respiratory protection

In the event of an accidental discharge of the material which produces a heavy vapour or mist, workers must put on officially approved respiratory protection equipment with a universal filter type including particle filter.

Material group	3621-04	Page 10 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019



Protective gloves

Wear chemical resistant gloves, such as barrier laminate, butyl rubber or nitrile rubber. 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 when there is a potential for eye contact.



Other skin protection

Wear appropriate chemical resistant clothing to prevent skin contact depending on the extent of exposure. During most normal work situations where exposure to the material cannot be avoided for a limited time span, waterproof pants and apron of chemical resistant material or coveralls of polyethylene (PE) will be sufficient. Coveralls of PE must be discarded after use if contaminated. In cases of excessive or prolonged exposure, coveralls of barrier laminate may be required.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on physical and chemical properties

Appearance	Blue liquid
Odour	Aromatic, almond-like
Odour threshold	Not determined
pH	1% solution in water: approx. 3.14 at 25°C
Melting point/freezing point	Below 0°C
Initial boiling point and boiling range	Crystallisation may occur from 0°C downward. Not determined
	Dimethoate : decomposes
	Cyclohexanone : 156°C
	Aromatic hydrocarbons : 155 - 181°C
Flash point	48°C (Setaflash closed cup)
Evaporation rate	(Butyl acetate = 1)
	Cyclohexanone : 0.3
	Aromatic hydrocarbons : 0.15
Flammability (solid/gas)	Not applicable (liquid)
Upper/lower flammability or explosive limits	Cyclohexanone : 1 - 9.4 vol% (≈ 1 - 9.4 kPa)
	Aromatic hydrocarbons : 0.8 - 7.0 vol% (≈ 0.8 - 7 kPa)
Vapour pressure	Dimethoate : 1.35 x 10 ⁻⁴ Pa at 25°C
	Cyclohexanone : 0.47 kPa at 20°C
	Aromatic hydrocarbons : 0.20 kPa at 20°C
	0.71 kPa at 38°C
Vapour density	(Air = 1)
	Cyclohexanone : 3.4
	Aromatic hydrocarbons : > 1

Material group	3621-04	Page 11 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

Relative density	Not determined
	Density: 1.06 g/ml at 20°C
Solubility(ies)	Solubility of dimethoate at 25°C in:
	cyclohexanone 1220 g/l
	n-heptane 0.242 g/l
	methanol 1590 g/l
	xylene 313 g/l
	water 39.8 g/l
Partition coefficient n-octanol/water	Dimethoate : log K_{ow} = 0.704
	Cyclohexanone : log K_{ow} = 0.86 at 25°C
	Aromatic hydrocarbons : some of the main components have log K_{ow} = 3.4 - 4.1
Autoignition temperature	310°C
Decomposition temperature	Not determined (however, see subsection 10.2.)
Viscosity	6.4 mPa.s at 20°C, 4.0 mPa.s at 40°C
Explosive properties	Not explosive
Oxidising properties	Not oxidising

9.2. Other information

Miscibility	The product is emulsifiable in water.
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SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity	To our knowledge, the product has no special reactivities.
10.2. Chemical stability	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.
10.3. Possibility of hazardous reactions	None known.
10.4. Conditions to avoid	Heating of the product will produce harmful and irritant vapours. The product can be ignited by e.g. flame, spark or hot surface.
10.5. Incompatible materials	Strong alkalis and strong oxidising compounds. The product can corrode metals (but does not meet the criteria for classification).
10.6. Hazardous decomposition products	See subsection 5.2.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects	* = Based on available data, the classification criteria are not met.
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Material group	3621-04	Page 12 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

Product

Acute toxicity	The product is harmful by ingestion and inhalation. It is considered as less harmful by skin contact. The acute toxicity is measured as:
Route(s) of entry	
- ingestion	LD ₅₀ , oral, rat: approx. 550 mg/kg (method OECD 425)
- skin	LD ₅₀ , dermal, rat: > 2000 mg/kg (method OECD 402) *
- inhalation	LC ₅₀ , inhalation, rat: approx. 3 mg/l/4 h (measured on a similar product, method FIFRA 81.03)
Skin corrosion/irritation	Not irritating to skin (method OECD 404). *
Serious eye damage/irritation	Moderately irritating to eyes (method OECD 405).
Respiratory or skin sensitisation ...	Weakly sensitising (method OECD 429).
Germ cell mutagenicity	The product contains no ingredient known to be mutagenic. *
Carcinogenicity	The product contains no ingredient known to be carcinogenic. *
Reproductive toxicity	The product contains no ingredient found to have adverse effects on reproduction. *
STOT – single exposure	Vapours may have narcotic effects at high doses. *
STOT – repeated exposure	The following is found for the active ingredient dimethoate: Target organ: nervous system (cholinesterase inhibition) LOAEL: 25 ppm (2.5 mg/kg bw/day) in a 90-day rat study. At this exposure level, minor cholinesterase inhibition was found, which generally does not result in observable effects or discomfort. LOEL: approx. 40 mg/kg bw/day. It must be considered debatable if the cholinesterase inhibition found at this level constitutes an effect that warrants classification. *
Aspiration hazard	The product presents an aspiration pneumonia hazard.
Symptoms and effects, acute and delayed	On contact, the first symptoms to appear may be irritation and 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.

Dimethoate

Toxicokinetics, metabolism and distribution	Dimethoate is rapidly absorbed and excreted following oral administration. It is extensively metabolised. Dimethoate and its metabolites are primarily found in the liver and kidneys. There is no evidence for accumulation.
Acute toxicity	The substance is harmful by ingestion and inhalation. It is considered as less harmful by skin contact. The acute toxicity is measured as:

Material group	3621-04	Page 13 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

Route(s) of entry - ingestion LD₅₀, oral, rat: 386 mg/kg (method FIFRA 81.01)
 - skin LD₅₀, dermal, rat: > 2000 mg/kg (method FIFRA 81.02) *
 - inhalation LC₅₀, inhalation, rat: approx. 1.6 mg/l/4 h

Skin corrosion/irritation Slightly irritating to skin (method FIFRA 81.05). *

Serious eye damage/irritation Moderately irritating to eyes (method FIFRA 81.04). *

Respiratory or skin sensitisation ... Not sensitising (method OECD 429). *

Cyclohexanone

Toxicokinetics, metabolism and distribution After oral intake, cyclohexanone is readily absorbed and widely distributed in the body. It is extensively metabolised to natural body constituents and partially taken up in the organism.

Acute toxicity Cyclohexanone is harmful by inhalation. It may have harmful effects by ingestion and skin contact as well. Study results for inhalation toxicity are divergent. The acute toxicity is measured as:

Route(s) of entry - ingestion LD₅₀, oral, rat: 1820 mg/kg (average of 6 study results)
 - skin LD₅₀, dermal, rabbit: 950 mg/kg (average of 5 study results)
 - inhalation LC₅₀, inhalation, rat: 3 - 30 mg/l/4 h

Skin corrosion/irritation Cyclohexanone has irritating properties to skin as has been found in several studies. It is not clear if the classification criteria are met.

Serious eye damage/irritation Cyclohexanone has irritating properties to eyes as has been found in several studies. It is not clear if the classification criteria are met.

Respiratory or skin sensitisation ... To our knowledge, no indications of allergenic effects have been reported. Negative results were found in a number of tests. *

Hydrocarbons, C9, aromatics

Acute toxicity The substance is not considered as harmful. * The acute toxicity is measured as:

Route(s) of entry - ingestion LD₅₀, oral, rat: 3592 mg/kg (method similar to OECD 401)
 - skin LD₅₀, dermal, rabbit: > 3160 mg/kg (method similar to OECD 402)
 - inhalation LC₅₀, inhalation, rat: > 6.2 mg/l/4 h (method similar to OECD 403)

Skin corrosion/irritation Mildly irritating to skin at prolonged exposure. Can cause skin dryness (method similar to OECD 404).

Serious eye damage/irritation May cause mild, short-lasting discomfort to eyes (method similar to OECD 405). *

Respiratory or skin sensitisation ... Not expected to cause allergic reactions (method similar to OECD 406). *

Material group	3621-04	Page 14 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

Aspiration hazard	Aromatic hydrocarbons present an aspiration hazard.
<u><i>Maleic anhydride</i></u>	
Toxicokinetics, metabolism and distribution	After oral intake, maleic anhydride is readily absorbed and widely distributed in the body. It is extensively metabolised to natural body constituents and partially taken up in the organism.
Acute toxicity	The substance is harmful by ingestion. The acute toxicity is measured as:
Route(s) of entry	- ingestion LD ₅₀ , oral, rat: 1090 mg/kg (method OECD 401)
	- skin LD ₅₀ , dermal, rabbit: 2620 mg/kg (method OECD 402) *
	- inhalation LC ₅₀ , inhalation, rat: no reliable data available
Skin corrosion/irritation	The substance is corrosive (method similar to OECD 404).
Serious eye damage/irritation	The substance is corrosive.
Respiratory or skin sensitisation ...	Allergenic properties have been observed in humans.

SECTION 12: ECOLOGICAL INFORMATION

- 12.1. **Toxicity** The product is toxic to aquatic invertebrates and highly toxic to insects. It may be harmful to birds and earthworms. It is non-toxic to fish, aquatic plants and soil macro- and microorganisms.

The acute ecotoxicity of **the product** is measured as:

- Fish	Bluegill sunfish (<i>Lepomis macrochirus</i>)	96-h LC ₅₀ : > 100 mg/l
- Invertebrates	Daphnids (<i>Daphnia magna</i>)	48-h EC ₅₀ : 8.9 mg/l
- Algae	Green algae (<i>Pseudokirchneriella subcapitata</i>)	72-h IC ₅₀ : 246 mg/l
- Bees	Honeybee (<i>Apis mellifera</i>)	48-h LC ₅₀ , contact: 0.37 µg/bee 48-h LC ₅₀ , oral: 0.29 µg/bee

The following has been measured on the active ingredient **dimethoate**:

- Invertebrates	Daphnids (<i>Daphnia magna</i>)	48-h EC ₅₀ : 2.0 mg/l 21-day NOEC: 0.04 mg/l
- Birds	Bobwhite quail (<i>Colinus virginianus</i>)	LD ₅₀ : 10.5 mg/kg
- Earthworms	<i>Eisenia foetida foetida</i>	14-day LC ₅₀ : 31 mg/kg dry soil

- 12.2. **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.

Material group	3621-04	Page 15 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

In aerobic soil and water **dimethoate** degrades rapidly, with primary 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 is readily biodegradable.

Aromatic hydrocarbons are not readily biodegradable. However, they are expected to be degraded in the environment at a moderate rate. A BOD₅/COD ratio of 0.43 was measured. When evaporated, they are expected to degrade rapidly to the air.

12.3. Bioaccumulative potential

See section 9 for octanol-water partition coefficients.

The active ingredient **dimethoate** does not bioaccumulate; it is rapidly metabolised and excreted.

Cyclohexanone is not expected to bioaccumulate.

Aromatic hydrocarbons have a moderate potential to bioaccumulate if continuous exposure is maintained. Most components can be metabolised by many organisms, bacteria, fungi, etc. BCFs of some of the main components are 300 - 400 (by model calculation).

12.4. Mobility in soil

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. It will rapidly evaporate.

Aromatic hydrocarbons are not mobile in the environment, but are highly volatile and will rapidly evaporate to the air if released into the water or on the surface of soil.

12.5. Results of PBT and vPvB assessment

None of the ingredients meets the criteria for being PBT or vPvB.

12.6. Other adverse effects

Other relevant hazardous effects in the environment are not known.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Remaining quantities of the material and empty but unclean packaging should be regarded as hazardous waste.

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

Disposal of product

According to the Waste Framework Directive (2008/98/EC), possibilities for reuse or reprocessing should first be considered. If this

Material group	3621-04	Page 16 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

is not feasible, the material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing.

Dimethoate is rapidly hydrolysed at pH > 8.0.

Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Disposal of packaging

It is recommended to consider possible ways of disposal in the following order:

1. Reuse or recycling should first be considered. Reuse is prohibited except by the authorisation holder. If offered for recycling, containers must be emptied and triply rinsed (or equivalent). Do not discharge rinsing water to sewer systems.
2. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.
3. Delivery of the packaging to a licensed service for disposal of hazardous waste.
4. Disposal in a landfill or burning in open air should only occur as a last resort. For disposal in a landfill, containers should be emptied completely, rinsed and punctured to make them unusable for other purposes. If burned, stay out of smoke.

SECTION 14: TRANSPORT INFORMATION

ADR/RID/IMDG/IATA/ICAO classification

- | | |
|--|---|
| 14.1. UN number | 1993 |
| 14.2. UN proper shipping name | Flammable liquid, n.o.s. (cyclohexanone, alkyl(C3-C4)benzenes and dimethoate) |
| 14.3. Transport hazard class(es) | 3 |
| 14.4. Packing group | III |
| 14.5. Environmental hazards | Marine pollutant |
| 14.6. Special precautions for user | Avoid any unnecessary contact with the product. Misuse can result in damage to health. Do not discharge to the environment. |
| 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC code | The product is not transported in bulk by ship. |

Material group	3621-04	Page 17 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

SECTION 15: REGULATORY INFORMATION

- 15.1. **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- Seveso category (Dir. 2012/18/EU): dangerous for the environment
 Second Seveso category: flammable
- Young people under the age of 18 are not allowed to work with the substance.
- All ingredients are covered by EU chemical legislation.
- 15.2. **Chemical safety assessment**
- A chemical safety assessment is not required to be included for this product.

♣ SECTION 16: OTHER INFORMATION

Relevant changes in the safety data sheet

Minor corrections only.

List of abbreviations

ACGIH	American Conference of Governmental Industrial Hygienists
AOEL	Acceptable Operator Exposure Level
BAT	Biologische Arbeitsstoff-Toleranzwert
BCF	BioConcentration Factor
BEI	Biological Exposure Index
BMGV	Biological Monitoring Guidance Value
BOD ₅	Biological Oxygen Demand (for 5 days)
CAS	Chemical Abstracts Service
COD	Chemical Oxygen Demand
Dir.	Directive
DNEL	Derived No Effect Level
EC	European Community, or Emulsifiable Concentrate
EC ₅₀	50% Effect Concentration
EINECS	European INventory of Existing Commercial Chemical Substances
EFSA	European Food Safety Authority
EKA	Expositionsäquivalent für Krebserzeugende Arbeitsstoffe
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
GHS	Globally Harmonized classification and labelling System of chemicals, Fifth revised edition 2013
HSE	Health & Safety Executive, UK
IBC	International Bulk Chemical code
IC ₅₀	50% Inhibition Concentration
ISO	International Organisation for Standardization
IUPAC	International Union of Pure and Applied Chemistry
LC ₅₀	50% Lethal Concentration
LD ₅₀	50% Lethal Dose
LOAEL	Lowest Observed Adverse Effect Level
LOEL	Lowest Observed Effect Level
MAK	Maximale Arbeitsplatz-Konzentration

Material group	3621-04	Page 18 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

MARPOL Set of rules from the International Maritime Organisation (IMO) for prevention of sea pollution
 n.o.s. Not otherwise specified
 OECD Organisation for Economic Cooperation and Development
 OSHA Occupational Safety and Health Administration
 PBT Persistent, Bioaccumulative, Toxic
 PEL Personal Exposure Limit
 PNEC Predicted No Effect Concentration
 Reg. Registration, or Regulation
 STEL Short-Term Exposure Limit
 STOT Specific Target Organ Toxicity
 TLV Threshold Limit Value
 TWA Time Weighted Average
 vPvB very Persistent, very Bioaccumulative
 WEL Workplace Exposure Limit
 WHO World Health Organisation

References Data measured on this and a similar product are unpublished company data. Data on ingredients are available from published literature and can be found several places.

Method for classification Flammable liquid: test data
 Acute oral toxicity: test data
 Inhalation toxicity: read-across
 Eye irritation: test data
 Sensitisation – skin: test data
 Aspiration toxicity: test data
 Hazards to the aquatic environment: calculation method

Used hazard statements
 H226 Flammable liquid and vapour.
 H242 Heating may cause a fire.
 H302 Harmful if swallowed.
 H304 May be fatal if swallowed and enters airways.
 H312 Harmful in contact with skin.
 H314 Causes severe skin burns and eye damage.
 H317 May cause an allergic skin reaction.
 H319 Causes serious eye irritation.
 H332 Harmful if inhaled.
 H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled.
 H335 May cause respiratory irritation.
 H336 May cause drowsiness or dizziness.
 H410 Very toxic to aquatic life with long lasting effects.
 H411 Toxic to aquatic life with long lasting effects.
 EUH401 To avoid risks to human health and the environment, comply with the instructions of use.

Advice on training This material should only be used by persons who are made aware of



Cheminova A/S
Thyborønvej 78
DK-7673 Harbøre
Denmark
+45 9690 9690
www.fmc.com
CVR No. DK 12 76 00 43

Material group	3621-04	Page 19 of 19
Product name	3621-04, DIMETHOATE 400 g/l EC	February 2019

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 FMC Corporation may exist. The user has to check the validity of the information under local circumstances.

Prepared by: FMC Corporation / Cheminova A/S / GHB