

Safety Data Sheet

according to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2015/830 and according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Date of issue: 10/10/2018 Revision date: : Version: 1.0

CLM-4543

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product form : Substance

Substance name : TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY

 EC Index-No.
 : 015-139-00-2 (Unlabeled)

 EC-No.
 : 235-963-8 (Unlabeled)

 CAS-No.
 : 13071-79-9 (Unlabeled)

Product code : CLM-4543

Formula : (*C2H5O)2P(S)SCH2SC(CH3)3

1.2. Relevant identified uses of the substance or mixture and uses advised against

1.2.1. Relevant identified uses

Main use category : Professional use

Industrial/Professional use spec : For professional use only

1.2.2. Uses advised against

No additional information available

1.3. Details of the supplier of the safety data sheet

Cambridge Isotope Laboratories, Inc.

50 Frontage Road Andover, MA 01810

USA

USA: 1-800-322-1174 Int: 1-978-749-8000 cilsales@isotope.com www.isotope.com

Emergency telephone number

Emergency numbers:

Chemtrec: 1-800-424-9300 (24 hours) International: 1-703-741-5970 (24 hours)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Acute Tox. 2 (Oral) H300 Acute Tox. 1 (Dermal) H310 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

Full text of hazard classes and H-statements : see section 16

Classification according to Directive 67/548/EEC [DSD] or 1999/45/EC [DPD]

T+; R27/28 N: R50/53

Full text of R-phrases: see section 16

GHS-US classification

Acute Tox. 2 (Oral) H300 Acute Tox. 1 (Dermal) H310 Aquatic Acute 1 H400 Aquatic Chronic 1 H410

Full text of H statements : see section 16

Adverse physicochemical, human health and environmental effects

No additional information available

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2.2. Label elements

Labeling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)





CHSOS

306

Signal word (CLP) : Danger

Hazard statements (CLP) : H300+H310 - Fatal if swallowed or in contact with skin

H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements (CLP) : P264 - Wash hands, forearms and face thoroughly after handling.

P270 - Do not eat, drink or smoke when using this product.

P273 - Avoid release to the environment.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310 - IF SWALLOWED: Immediately call a doctor. P302+P352 - IF ON SKIN: Wash with plenty of soap and water.

P310 - Immediately call a doctor.

P330 - Rinse mouth.

GHS-US labeling

Hazard pictograms (GHS-US)





GHS06

GHS09

Signal word (GHS-US) : Danger

Hazard statements (GHS-US) : H300+H310 - Fatal if swallowed or in contact with skin

H410 - Very toxic to aquatic life with long lasting effects

Precautionary statements (GHS-US) : P262 - Do not get in eyes, on skin, or on clothing.

P264 - Wash hands, forearms and face thoroughly after handling.

P270 - Do not eat, drink or smoke when using this product.

P273 - Avoid release to the environment.

P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310 - If swallowed: Immediately call a poison center or doctor

P302+P352 - If on skin: Wash with plenty of water P310 - Immediately call a poison center or doctor

P321 - Specific treatment (see supplemental first aid instruction on this label)

P322 - Specific treatment (see supplemental first aid instruction on this label)

P330 - Rinse mouth.

P361+P364 - Take off immediately all contaminated clothing and wash it before reuse.

P391 - Collect spillage. P405 - Store locked up.

P501 - Dispose of contents/container to hazardous or special waste collection point, in

accordance with local, regional, national and/or international regulation

2.3. Other hazards

No additional information available

SECTION 3: Composition/Information on ingredients

3.1. Substances

Name	Product identifier	%	Classification according to Directive 67/548/EEC
TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY	(CAS-No.) 13071-79-9 (Unlabeled) (EC-No.) 235-963-8 (Unlabeled) (EC Index-No.) 015-139-00-2 (Unlabeled)	100	T+; R27/28 N; R50/53
Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY	(CAS-No.) 13071-79-9 (Unlabeled) (EC-No.) 235-963-8 (Unlabeled) (EC Index-No.) 015-139-00-2 (Unlabeled)	100	Acute Tox. 2 (Oral), H300 Acute Tox. 1 (Dermal), H310 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of R- and H- phrases: see section 16

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Name	Product identifier	%	GHS-US classification
TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (Main constituent)	(CAS-No.) 13071-79-9 (Unlabeled)	100	Acute Tox. 2 (Oral), H300 Acute Tox. 1 (Dermal), H310 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of H-phrases: see section 16

3.2. Mixtures

Not applicable

SECTION 4: First aid measures

4.1. Description of first aid measures

First-aid measures general First-aid measures after inhalation

: If you feel unwell, seek medical advice (show the label where possible). Evacuate danger area.

: When symptoms occur: go into open air and ventilate suspected area. If not breathing, give

artificial respiration. Get medical advice/attention.

First-aid measures after skin contact

: Get immediate medical advice/attention. Immediately call a poison center or doctor/physician. Specific measures (see Hazard pictograms (CLP) on this label). Gently wash with plenty of soap and water. Remove/Take off immediately all contaminated clothing. Wash contaminated elething before rause.

First-aid measures after eye contact

: Rinse cautiously with water for several minutes.

First-aid measures after ingestion

: Never give anything by mouth to an unconscious person. Rinse mouth out with water. Get medical advice/attention. Fatal if swallowed. Immediately call a poison center or doctor/physician. Specific treatment (see Hazard pictograms (CLP) on this label).

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

Symptoms/effects after inhalation : May be harmful if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact : Fatal in contact with skin. Symptoms/effects after eye contact : May cause eye irritation. Symptoms/effects after ingestion : Fatal if swallowed.

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

No additional information available

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media : Water spray. dry chemical powder, alcohol-resistant foam, carbon dioxide (CO2).

5.2. Special hazards arising from the substance or mixture

No additional information available

5.3. Advice for firefighters

Firefighting instructions

: Fight fire with normal precautions from a reasonable distance. Wear a self contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

Protection during firefighting

: Do not enter fire area without proper protective equipment, including respiratory protection. Wear recommended personal protective equipment.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures

: Use personal protective equipment as required. Avoid breathing vapors, mist, gas. Avoid dust formation. Ensure adequate air ventilation.

6.1.2. For emergency responders

Protective equipment

: Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2. Environmental precautions

Prevent entry to sewers and public waters. Do not allow to enter drains or water courses. Avoid release to the environment.

6.3. Methods and material for containment and cleaning up

For containment

: Small quantities of liquid spill: take up in non-combustible absorbent material and shovel into container for disposal. For large spills, confine the spill in a dike and charge it with wet sand or earth for subsequent safe disposal.

Methods for cleaning up

: This material and its container must be disposed of in a safe way, and as per local legislation.

6.4. Reference to other sections

For further information refer to section 13.

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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling : Provide adequate ventilation to minimize dust and/or vapor concentrations. Do not get in eyes,

on skin, or on clothing.

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. Do not eat, drink or

smoke when using this product. Wash hands, forearms and face thoroughly after handling.

7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Store in a well-ventilated place. Keep container tightly closed. Storage conditions : Store at room temperature away from light and moisture.

7.3. Specific end use(s)

No additional information available

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled))		
Italy - Portugal - USA ACGIH	ACGIH TWA (mg/m³)	0.01 mg/m³ USA. ACGIH Threshold Limit Values (TLV)
Italy - Portugal - USA ACGIH	Remark (ACGIH)	Cholinesterase inhibition Substances for which there is a Biological Exposure Index or Indices (see BEI® section), see BEI® for Acetylcholinesterase Inhibiting; Pesticide; Not classifiable as a human carcinogen; Danger of cutaneous absorption

8.2. Exposure controls

Appropriate engineering controls : Wash hands and other exposed areas with mild soap and water before eating, drinking or

smoking and when leaving work.

Personal protective equipment : Gloves. Protective clothing. Protective goggles. Self-contained breathing apparatus.









Materials for protective clothing : Wear suitable protective clothing and gloves. Hand protection : Wear suitable protective clothing and gloves.

Eye protection : Wear eye protection. Chemical goggles or face shield with safety glasses.

Skin and body protection : Wear suitable protective clothing, gloves and eye/face protection.

Respiratory protection : In case of inadequate ventilation wear respiratory protection. Approved supplied air respirator.

Environmental exposure controls : Avoid release to the environment.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state : Liquid
Appearance : Clear, Liquid

Molecular mass : 292.4 g/mol (Labeled)

Color : Colorless

Odor : No data available
Odor threshold : No data available
pH : No data available
Relative evaporation rate (butyl acetate=1) : No data available
Melting point : No data available
Freezing point : No data available

Boiling point : 69 °C (156 °F) at 0.01 hPa (0.01 mmHg)

Flash point : No data available
Auto-ignition temperature : No data available
Decomposition temperature : No data available
Flammability (solid, gas) : No data available
Vapor pressure : No data available
Relative vapor density at 20 °C : No data available
Relative density : No data available

Specific gravity / density : 1.105 g/ml at 24 °C (75 °F)

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Solubility : No data available

Log Pow : 4.48

Log Kow : No data available
Viscosity, kinematic : No data available
Viscosity, dynamic : No data available
Explosive properties : No data available
Oxidizing properties : No data available
Explosion limits : No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable if stored under recommended conditions.

10.3. Possibility of hazardous reactions

No additional information available

10.4. Conditions to avoid

No additional information available

10.5. Incompatible materials

Strong oxidizing agents.

10.6. Hazardous decomposition products

Carbon oxides (CO, CO2). Sulphur oxides. Oxides of phosphorus.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity : Oral: Fatal if swallowed. Dermal: Fatal in contact with skin.

TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled))	
ATE CLP (oral)	5.000 mg/kg body weight
ATE CLP (dermal)	5.000 mg/kg body weight

Skin corrosion/irritation : Not classified Serious eye damage/irritation : Not classified Respiratory or skin sensitization : Not classified Germ cell mutagenicity : Not classified Carcinogenicity Not classified Reproductive toxicity : Not classified Specific target organ toxicity - single exposure : Not classified : Not classified Specific target organ toxicity - repeated exposure

Aspiration hazard : Not classified

Potential Adverse human health effects and

symptoms

: This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. Fatal if swallowed. Fatal in

contact with skin.

Symptoms/effects after inhalation : May be harmful if inhaled. May cause respiratory irritation.

Symptoms/effects after skin contact : Fatal in contact with skin.

Symptoms/effects after eye contact : May cause eye irritation.

Symptoms/effects after ingestion : Fatal if swallowed.

SECTION 12: Ecological information

12.1. Toxicity

Ecology - water : Very toxic to aquatic life with long lasting effects.

TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled))	
LC50 fish 1	0.008 mg/l - Oncorhynchus mykiss (rainbow trout) - 96.0 h

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TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled))	
EC50 Daphnia 1	< 0.01 mg/l - Daphnia magna (Water flea) - 48 h

12.2. Persistence and degradability

TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled))	
Persistence and degradability	May cause long-term adverse effects in the environment.

12.3. Bioaccumulative potential

TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled))	
BCF fish 1	8.5 - μg/l. Cyprinodon variegatus (sheepshead minnow) - 96 h
Bioconcentration factor (BCF REACH)	286
Log Pow	4.48

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

No additional information available

12.6. Other adverse effects

Other adverse effects

: Environmental precautions. Avoid release to the environment. Disposal must be done according to official regulations. Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Regional legislation (waste)

: Waste materials should be disposed of under conditions which meet Federal, State, and local

environmental control regulations.

Product/Packaging disposal recommendations

Offer surplus and non-recyclable solutions to a licensed disposal company. Contact a licensed professional waste disposal service to dispose of this material. Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Ecology - waste materials : Dispose of as unused product. Hazardous waste due to toxicity.

SECTION 14: Transport information

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN number

UN-No.(DOT) : 2810 DOT NA no. UN2810

14.2. UN proper shipping name

Proper Shipping Name (DOT)

: Toxic, liquids, organic, n.o.s.

TERBUFOS

Class (DOT)

: 6.1 - Class 6.1 - Poisonous materials 49 CFR 173.132

Hazard labels (DOT) : 6.1 - Poison



DOT Symbols

: G - Identifies PSN requiring a technical name

Packing group (DOT)

: I - Great Danger

DOT Special Provisions (49 CFR 172.102)

T14 - 6 6 mm Prohibited 178.275(g)(3).

TP2 - a. The maximum degree of filling must not exceed the degree of filling determined by the following: (image) Where: tr is the maximum mean bulk temperature during transport, tf is the temperature in degrees celsius of the liquid during filling, and a is the mean coefficient of cubical expansion of the liquid between the mean temperature of the liquid during filling (tf) and the maximum mean bulk temperature during transportation (tr) both in degrees celsius. b. For liquids transported under ambient conditions may be calculated using the formula: (image) Where: d15 and d50 are the densities (in units of mass per unit volume) of the liquid at 15 C (59 F) and 50 C (122 F), respectively.

TP13 - Self-contained breathing apparatus must be provided when this hazardous material is transported by sea.

TP27 - A portable tank having a minimum test pressure of 4 bar (400 kPa) may be used provided the calculated test pressure is 4 bar or less based on the MAWP of the hazardous material, as defined in 178.275 of this subchapter, where the test pressure is 1.5 times the MAWP.

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DOT Packaging Exceptions (49 CFR 173.xxx) : None
DOT Packaging Non Bulk (49 CFR 173.xxx) : 201
DOT Packaging Bulk (49 CFR 173.xxx) : 243

14.3. Additional information

Emergency Response Guide (ERG) Number : 153

Other information : No supplementary information available.

Special transport precautions : Not dangerous.

Overland transport

Packing group (ADR) : I

Class (ADR) : 6.1 - Toxic substances

Hazard identification number (Kemler No.) : 66 Classification code (ADR) : T1

Hazard labels (ADR) : 6.1 - Toxic substances



Orange plates

66 2810

Tunnel restriction code (ADR) : C/E
Limited quantities (ADR) 0

EAC : 2X
APP : B

Excepted quantities (ADR) : E5

Transport by sea

DOT Vessel Stowage Location : B - (i) The material may be stowed "on deck" or "under deck" on a cargo vessel and on a

passenger vessel carrying a number of passengers limited to not more than the larger of 25 passengers, or one passenger per each 3 m of overall vessel length; and (ii) "On deck only" on passenger vessels in which the number of passengers specified in paragraph (k)(2)(i) of this

section is exceeded.

DOT Vessel Stowage Other : 40 - Stow "clear of living quarters"

MFAG-No : 153

Air transport

DOT Quantity Limitations Passenger aircraft/rail : 1 L

(49 CFR 173.27)

DOT Quantity Limitations Cargo aircraft only (49 : 30 L

CFR 175.75)

Civil Aeronautics Law : Toxic and infectious substances/Toxic substances

14.4. Environmental hazards

Dangerous for the environment



Other information : No supplementary information available.

14.5. Special precautions for user

Special transport precautions : Not dangerous.

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

Not applicable

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SECTION 15: Regulatory information 15.1. US Federal regulations TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled)) SARA Section 302 Threshold Planning Listed on the United States SARA Section 302 Quantity (TPQ) Not subject to reporting requirements of the United States SARA Section 313. SARA Section 313 - Emission Reporting

15.2. International regulations

CANADA

TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY (13071-79-9 (Unlabeled))

Listed on the Canadian DSL (Domestic Substances List)

15.2.1. **National regulations**

No additional information available

15.3. US State regulations

TERBUFOS (DIETHOXY-13C4, 99%) 97% CHEMICAL PURITY(13071-79-9 (Unlabeled))	
U.S California - Proposition 65 - Carcinogens List	No
U.S California - Proposition 65 - Developmental Toxicity	No
U.S California - Proposition 65 - Reproductive Toxicity - Female	No
U.S California - Proposition 65 - Reproductive Toxicity - Male	No
State or local regulations	U.S Massachusetts - Right To Know List U.S New Jersey - Right to Know Hazardous Substance List U.S Pennsylvania - RTK (Right to Know) List

SECTION 16: Other information

Other information

: This product is not radioactive. The data given for this product are those of the corresponding unlabeled compound, unless specifically indicated otherwise. Health and safety data for labeled compounds are generally not available, but are assumed to be similar or identical to the corresponding unlabeled compound.

Full text of R-, H- and EUH-phrases:

Acute Tox. 1 (Dermal)	Acute toxicity (dermal) Category 1
Acute Tox. 2 (Oral)	Acute toxicity (oral) Category 2
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment - Chronic Hazard Category 1
H300	Fatal if swallowed
H310	Fatal in contact with skin
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects
R27/28	Very toxic in contact with skin and if swallowed
R50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
N	Dangerous for the environment
T+	Very toxic

NFPA health hazard : 4 - Materials that, under emergency conditions, can be

NFPA fire hazard : 0 - Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

NFPA reactivity 0 - Material that in themselves are normally stable, even under fire conditions.

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Hazard Rating

Health : 4 Severe Hazard - Life-threatening, major or permanent damage may result from single or

repeated overexposures

Flammability : 0 Minimal Hazard
Physical : 0 Minimal Hazard

CIL Substance SDS

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product

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