Safety data sheet as per Commission Regulation (EU) 2015/830
Product: Diethyl thiophosphoryl chloride (DETC)

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

1.1 Product identifier

Trade name	**Diethyl thiophosphoryl chloride (DETC)**
Chemical Name	O,O-Diethyl thiophosphoryl chloride (DETC)

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

Relevant identified uses	In the manufacture of organophosphorus pesticides, oil & gasoline additives, flame retardants, flotation agents
Uses identified against	Food additive, medicinal products, cosmetic products

1.3 Details of the supplier of the safety data sheet:

Manufacturer	Prasol Chemicals Limited Prasol House, Plot No.A-17/2/3, T.T.C. Industrial Area, Khairne M.I.D.C., Navi Mumbai - 400 710. Maharashtra, India.
Telephone	+91-22-27782555/ 61952500
Telefax	+91-22-61952577
e-mail address	sales@prasolchem.com; inquiry@prasolchem.com

1.4 Emergency telephone number

Telephone	+91-22- 27782555/ 61952500
Language	English

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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

Acute Toxicity - Oral	Category 4	H302	Harmful if swallowed
Acute Toxicity - Dermal	Category 2	H311	Toxic in contact with skin
Skin Irritation	Category 1B	H314	Causes severe skin burns and eye damage
Acute Toxicity - Inhalation	Category 2	H330	Fatal if inhaled
Aquatic Chronic	Category 2	H412	Harmful to aquatic life with long lasting effects

Information concerning particular hazards for human and environment: No further information

2.2 Label elements

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

Hazard pictograms

GHS05 GHS06 GHS09

Signal word Danger

Hazard statements

H302	Harmful if swallowed
H311	Toxic in contact with skin
H314	Causes severe skin burns and eye damage
H330	Fatal if inhaled
H412	Harmful to aquatic life with long lasting effects

Precautionary statements

General	P103	Read label before use.
Prevention	P260	Do not breathe in dusts or mists.
	P264	Wash hands thoroughly after handling.
	P270	Do not eat, drink or smoke when using this product.
	P271	Use only outdoors or in a well-ventilated area.
	P273	Avoid release to the environment.
	P280	Use protective gloves and eye protection.
	P284	Wear respiratory protection.
Response	P301+P317	IF SWALLOWED: Get medical help.
	P301+P330+P331	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
	P302+P352	IF ON SKIN: Wash with plenty of water.
	P302+P361+P354	IF ON SKIN: Take off immediately all contaminated clothing. Immediately rinse with water for several minutes.
	P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing
	P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses,

		if present and easy to do. Continue rinsing
	P316	Get emergency medical help immediately.
	P320	Specific treatment is urgent.
	P321	Specific treatment: wash with plenty of water and mild soap.
	P361+P364	Take off immediately all contaminated clothing and wash it before reuse.
	P363	Wash contaminated clothing before reuse.
Storage	P403+P233	Store in a well-ventilated place. Keep container tightly closed
	P405	Store locked up.
Disposal	P501	Dispose of contents and container in accordance with national regulations

2.3 Other hazards

Not a PBT, vPVB substance according to the criteria of REACH regulation

SECTION 3: Composition/information on ingredients

3.1 Substances

Name	O,O-Diethyl thiophosphoryl chloride
CAS Number	2524-04-1
EC Number	219-755-4
Molecular Formula	$C_4H_{10}ClO_2PS$
Molecular Weight	188.61

Ingredient	Classification	Concentration (%)
O,O-Diethyl thiophosphoryl chloride (DETC)	Ac. Tox. Oral 4, Ac. Tox. Der. 3, Skin Corr. 1B, Ac. Tox. Inhal. 2, Aq. Chr. 2 H302, H311, H314, H330, H412	98 - 100

3.2 Mixtures not applicable

SECTION 4: First aid measures

4.1 Description of first aid measures

General information Symptoms of poisoning may only appear several hours later. When symptoms persist or in all cases of doubt seek medical advice. Remove from exposure, lie down. Never give anything by mouth to an unconscious person.

After inhalation After inhalation of vapours during processing, remove the patient to fresh air at once.

After skin contact Take off all contaminated clothing immediately. If symptoms persist, call a physician. Wash off immediately with soap and plenty of water.

After eye contact Rinse immediately with plenty of water and seek medical advice.

After swallowing Do not induce vomiting and seek medical advice immediately.

4.2 Most important symptoms and effects, both acute and delayed Salivation, lacrimation, blurry vision, excessive bronchial secretions, sweating, weakness, muscle fasciculations, diarrhea, and loss of bladder control

4.3 Indication of any immediate medical attention and special treatment needed Irritated skin should be treated as usual against effects of acids or acid fumes. In case lungs are affected watch for pulmonary oedema and possible cholinesterase inhibition. Cholinesterase inhibitors affect the central and peripheral nervous systems and produce respiratory depression.

Treatment of cholinesterase inhibition

If cholinesterase inhibition occurs, the following treatment may be applied: Decontamination procedures such as whole body washing, gastric lavage and administration of activated charcoal are often required. Probable mucosal damage may contraindicate the use of gastric lavage. Antidote: 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 may occur after initial improvement. VERY CLOSE SUPERVISION OF THE PATIENT IS INDICATED FOR AT LEAST 48 HOURS, DEPENDING ON THE SEVERITY OF POISONING

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media CO_2, dry powder, foam

	Unsuitable extinguishing media	water jet
5.2	**Special hazards arising from the substance or mixture**	The essential breakdown products are volatile, toxic, malodorous, irritant and inflammable compounds such as hydrogen sulphide, hydrogen chloride, sulphur dioxide, ethyl mercaptan, diethyl sulphide, phosphorous pentoxide, carbon monoxide and carbon dioxide Closed container may rupture if strongly heated. Combustible liquid. Explosive mixtures may occur at temperatures at or above the flashpoint.
5.3	**Advice for firefighters**	Cool closed containers exposed to fire with water spray. Wear self-contained breathing apparatus.

SECTION 6: Accidental release measures

6.1	**Personal precautions, protective equipment and emergency procedures**	Use personal protective equipment. Avoid breathing vapours, mist or gas during processing. Ensure adequate ventilation
6.2	**Environmental precautions**	Do not allow to enter sewers, surface or ground water.
6.3	**Methods and material for containment and cleaning up**	Soak up with inert absorbent material and dispose of as hazardous waste. Keep in suitable, closed containers for disposal. Suitable binder: sand
6.4	**Reference to other sections**	Section 8 for information on personal protection equipment. Section 13 for disposal information

SECTION 7: Handling and storage

7.1	**Precautions for safe handling**	If possible, use material transfer, metering and blending plants that are closed. Avoid contact with skin and eyes. Avoid inhalation of vapour or mist.
7.2	**Conditions for safe storage, including any incompatibilities**	
	Advice on protection against fire and explosion	Follow normal measures for preventive fire protection.
	Storage	German storage class: 10 - Combustible liquids Store in a cool place. Keep container tightly closed in a dry and well-ventilated place. Mechanical exhaust required.
	Packaging material	Corrosion resistant drums
	Incompatibility	Strong alkalis. Amines and strong oxidising compounds. Metals
	Advice on common storage	Observe prohibition against storing together!
	Storage stability	Maximum Storage Temperature: 45°C
7.3	**Specific end use(s)**	No further relevant information available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limit: No known occupational exposure limit values.

8.2 Exposure controls

Appropriate engineering controls: If possible, use material transfer, metering and blending plants that are closed

Personal protective equipment

Eye/ face protection: closed goggles, face shield

Skin protection

Hand protection

Type of material	Thickness	Breakthrough time
Butyl-rubber	0.5 mm	> 480 min
Polychloroprene (PCP)	0.5 mm	110 min

Body protection: Boots, body suit

Respiratory protection: NIOSH approved respirator; Avoid inhaling vapours.

Thermal hazards: Combustible liquid, possibility of decomposition on excess heating

Industrial hygiene:
Avoid contact with skin and eyes.
Remove immediately all contaminated clothing.
Keep working clothes separately.
Smoking, eating and drinking should be prohibited in the application area.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	Colorless to pale yellow liquid
Odour	Characteristic of chloro compounds, pungent
Odour threshold	no data available
pH	Highly acidic
Melting point	<-75°C
Boiling point	96-98°C/ 25mmHg
Flash point	92°C (closed cup)
Evaporation rate	not determined
Flammability (solid, gas)	not applicable (product is a liquid)
Flammability limits	no data available
Vapour pressure	2.82MMhg at 50°C
Vapour density	not determined
Relative density	1.2 at 25°C
Solubility in water	Not applicable (decomposes)
Partition coefficient	Log Pow 2.37, calculated as substance decomposes in water
Ignition temperature	290°C
Decomposition temperature	no data available
Viscosity at 100 °C	Not determined
Explosive properties	no explosive properties based on chemical structure
Oxidizing properties	no oxidizing properties based on chemical structure

9.2 Other information no further information

SECTION 10: Stability and reactivity

10.1	**Reactivity**	No hazardous reaction when handled and stored according to provisions.
10.2	**Chemical stability**	Under storage at normal ambient temperatures (-40°C to +45°C), the product is stable.
10.3	**Possibility of hazardous reactions**	Spontaneous decomposition may start on heating; After prolonged heating, slow decomposition may start at above 50°C.
10.4	**Conditions to avoid**	Extremes of temperature and direct sunlight.
10.5	**Incompatible materials**	Strong alkalis. An acid-base neutralisation reaction can be hazardous because of heat release. Amines and strong oxidising compounds. The substance can corrode metals.
10.6	**Hazardous decomposition products**	formation of volatile, toxic, malodorous, irritant and inflammable compounds such as hydrogen sulphide, hydrogen chloride, sulphur dioxide, ethyl mercaptan, diethyl sulphide, phosphorous pentoxide, carbon monoxide and carbon dioxide. possible

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

LD50	Oral	rat	953mg/kg bw	**Category 4, H302**
LD50	Inhalation	rat	615mg/kg bw	**Category 2, H330**
LD50	Dermal	rat	719mg/kg bw	**Category 3, H311**

Skin irritation	Irritating 24 h (rabbit) **Category 1B, H314**
Serious eye irritation	Irritating 24 h (rabbit) **Category 1B, H314**
Respiratory or skin sensitization	Not determined as substance is corrosive
Germ cell mutagenicity	non mutagenic (Ames test)
Carcinogenicity	no data available
Reproductive toxicity	NOAEL 30 mg/kg/day (rat)
STOT-single exposure	irritating to eye and skin;
STOT-repeated exposure	irritation of the nose and thickening of alveolar walls in the lungs.

SECTION 12: Ecological information

12.1 Toxicity

Aquatic toxicity

Toxicity to fish No data available

	Toxicity to aquatic invertebrates	EC50	48h	5.2mg/L	*Daphnia magna*
	Toxicity to aquatic algae and cyanobacteria	EC50	72h	11mg/L	*Desmodesmus subspicatus*

12.2	**Persistence and degradability**	
	Biodegradation	Not readily biodegradable; 9% in 28days
12.3	**Bioaccumulative potential**	very low potential for bioaccumulation, decomposes in water
12.4	**Mobility in soil**	High mobility in soil but relatively low stability
12.5	**Results of PBT and vPvB assessment**	Not a PBT, vPvB substance according to the REACH regulation
12.6	**Other adverse effects**	Harmful to aquatic organisms The material is harmful to the environment **Aq. Chr. Cat 2, H412**

SECTION 13: Disposal considerations

13.1	**Waste treatment methods**	Observe all federal, state, and local environmental regulations. Contact a licensed professional waste disposal service to dispose of this material. Dissolve or mix the material with a combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Do not dispose in sewage.

SECTION 14: Transport information

		ADR/RID	IMDG	ICAO/IATA
14.1	**UN Number**	2751	2751	2751
14.2	**UN proper shipping name**	Diethyl thiophosphoryl chloride		
14.3	**Transport hazard class**	8	8	8
14.4	**Packaging group**	II	II	II
14.5	**Environmental hazards**	environmentally hazardous, marine pollutant		
14.6	**Special precautions for the user**	Combustible liquid; Flash point 92°C (closed cup) Environmentally hazardous substance. Marine pollutants. Irritating to the eyes. Keep dry. Keep separated from foodstuffs		
	EmS number	F-A (S-B)		
14.7	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	See regulatory information for transport approval		

SECTION 15: Regulatory information

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

Major accident hazard **Seveso III** no

International Chemical Inventory Status

USA (TSCA)	Listed (Tracking No. 103754)
Canada (DSL)	listed
Australia (AICS)	listed
Japan (MITI)	listed
Korea (KECL)	Listed (KE Number 10526)
Philippines (PICCS)	listed
China	listed
New Zealand	listed
Taiwan	listed

15.2 Chemical safety assessment A Chemical Safety Assessment will be carried out at the time of REACH registration

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

Further information:

Sections in which changes have been made since the last version are marked with a diamond ◆ in the left hand margin.

Abbreviations and acronyms in English language:

ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
AICS	Australian Inventory of Chemical Substances
CAS	Chemical Abstracts Service (division of the American Chemical Society)
CLP	Classification for Labeling and Packaging
DSL	Domestic Substances List

EC	European Commission
EC50	Half maximal effective concentration
EINECS	European Inventory of Existing Commercial Chemical Substances
GHS	Globally Harmonized System of Classification and Labeling of Chemicals
IATA	International Air Transport Association
IBC	International Bulk Chemical
ICAO	International Civil Aviation Organization
IMDG	International Maritime Code for Dangerous Goods
KECL	Korea Existing Chemicals List
LC50	Lethal concentration, 50 percent
LD50	Lethal dose, 50 percent
MARPOL	International Convention for the Prevention of Pollution from Ships
MITI	Ministry of International Trade and Industry
NOAEL	No Observed Adverse Effect Level
PBT	Persistent, bioaccumulative and toxic substances
PICCS	Philippine Inventory of Chemicals and Chemical Substances
RID	Regulations Concerning the International Transport of Dangerous Goods by Rail
STOT	Specific target organ toxicity
TSCA	Toxic Substances Control Act
UN	United Nations
vPVB	(very) Persistent, (very) Bioaccumulative

Sources

Commission Regulation (EU) 2015/830 of 28 May 2015 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

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