

Safety Data Sheet

1. IDENTIFICATION

Product Name:	DOPO
Other Names:	(9,10-Dihydro-9-oxa-10-phosphaphenanthrene10-oxide 6-H-dibenz(c,e)(1,2) oxaphosphorin 6-oxide)
Recommended Use:	Can be used in liner polyester,polyamide,epoxy resin,widely used in plastic,circuit board for electronic equipment.
Supplier:	Global Chemie ASCC Limited
Street Address:	88/123 Moo 2 Bangpoo Industrial Estate (North), Phraek Sa Mai, Mueang Samutprakan, Samutprakan 10280
Telephone:	+66 2324 6888
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Emergency phone:	+66 2324 6888 ext.320

2. HAZARDS IDENTIFICATION

Classification of the Substance or Mixture

This product is classified as hazardous under GHS criteria

Hazardous Classification

Skin sensitisation, category 1B

Hazardous Statement

Highly Flammable liquid and vapour

GHS Pictograms



Hazard Statements

H317: May cause an allergic skin reaction.

Precautionary Statements

P261: Avoid breathing dust/fume/gas/mist/vapours/spray.

P272: Contaminated work clothing should not be allowed out of the workplace.

P280: Wear protective gloves/protective clothing/eye protection/face protection/hearing protection.

P302+P352: IF ON SKIN: Wash with plenty of water.

P333+P313: If skin irritation or rash occurs: Get medical advice/attention.

P362+P364: Take off contaminated clothing and wash it before reuse.

Response Statements

If on skin

No data available.

If inhaled

No data available.

If in eye

No data available.

If swallowed

No data available.

Storage Statements

No data available.

Disposal Statements

P501: Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

Signal Word: Warning

3. COMPOSITION: Information on Ingredients

Chemical Ingredient	CAS No.	UN No.	Proportion (%w/w)
6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide	35948-25-5	-	> 99

Molecular Formula: $C_{12}H_9O_2P$

Molecular weight: 216.17 g/mol

4. FIRST AID MEASURES

For advice, contact Ramathibodi Poison Center (Phone: 1367) or a doctor.

Ingestion

Rinse your mouth thoroughly with water. If the person is fully conscious, try to induce vomiting. Get medical advice/attention if you feel unwell.

Eye Contact

Remove contact lenses, if present and easy to do. Continue rinsing. Immediately flush eyes thoroughly with water for at least 15 minutes. Get medical attention if irritation persists after washing.

Skin Contact

Wash skin with plenty of water. Take off contaminated clothing. If skin irritation or rash occurs: Get medical advice/attention.

Inhalation

Remove people to fresh air and keep comfortable for breathing. If breathing stops, give artificial respiration. If you feel unwell, seek medical advice.

Most important symptoms and effects, both acute and delayed

Symptoms/effects after skin contact: May cause an allergic skin reaction.

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

Suitable extinguishing media: Water spray. Dry powder Foam Carbon dioxide.

Unsuitable extinguishing media: Do not use a water jet since it may cause the fire to spread.

Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire: Toxic fumes may be released.

Advice for firefighters

Protection during firefighting: Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.

6. ACCIDENTAL RELEASE MEASURES.**Personal precautions, protective equipment and emergency procedures****For non-emergency personnel**

Emergency procedures: Ventilate spillage area. Avoid contact with skin and eyes. Avoid breathing dust/fume/gas/mist/vapours/spray. Avoid dust formation. Keep away from ignition sources.

For emergency responders

Protective equipment: Do not attempt to act without suitable protective equipment.

Environmental precautions

Avoid release to the environment.

Methods and material for containment and cleaning up

Methods for cleaning up: Mechanically recover the product. Sweep or shovel spills into appropriate container for disposal.

Other information: Dispose of materials or solid residues at an authorized site.

7. HANDLING AND STORAGE**Precautions for safe handling**

Precautions for safe handling : Ensure good ventilation of the work station. Avoid contact with skin and eyes. Avoid breathing dust/fume/gas/mist/vapours/spray. Wear personal protective equipment. Keep away from open flames, hot surfaces and sources of ignition.

Hygiene measures Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse. Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

Conditions for safe storage, including any incompatibilities

Store in a well-ventilated place. Keep cool. Keep container tightly closed and dry. Protect from heat and direct sunlight. Protect from physical damage.

Specific end use(s)

No data available.

8. EXPOSURE CONTROLS: PERSONAL PROTECTION**Control parameters****National occupational exposure and biological limit values**

No data available.

Recommended monitoring procedures

No data available.

Air contaminants formed

No data available.

DNEL and PNEC

6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
DNEL/DMEL (Workers)	
Long-term - systemic effects, dermal	3.5 mg/kg bodyweight/day
Long-term - systemic effects, inhalation	27.5 mg/m ³
PNEC (Water)	
PNEC aqua (freshwater)	0.1 mg/l
6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
PNEC aqua (marine water)	0.01 mg/l

PNEC (Sediment)	
PNEC sediment (freshwater)	0.72 mg/kg dwt
PNEC sediment (marine water)	0.072 mg/kg dw
PNEC (Soil)	
PNEC soil	0.085 mg/kg dwt

Control banding

No data available.

Exposure controls

Appropriate engineering controls

Ensure good ventilation of the work station.

Personal protective equipment symbol(s):

Eye protection:

Safety glasses

Skin protection

Wear suitable protective clothing

Hand protection:

Protective gloves

Respiratory protection

In case of insufficient ventilation, wear suitable respiratory equipment

Thermal hazards

No additional information available

Environmental Exposure Controls

Avoid release to the environment.

9. PHYSICAL AND CHEMICAL PROPERTIES

Property	Unit of Measurement	Typical Value
Appearance	-	Crystalline powder
Odour	-	No data available
pH	-	No data available
Boiling point	°C	No data available
Melting point	°C	122
Flash point	°C	222
Flammability	-	Not flammable
Autoignition Temperature	°C	No data available
Decomposition Temperature	°C	No data available
Lower/Upper Flammability Limits	%V	No data available
Density @ 20°C	g/cm³	1.42
Specific Gravity @ 20°C	-	No data available

Property	Unit of Measurement	Typical Value
Viscosity @ 20°C	mPa.s	No data available
Vapor pressure @ 20°C	kPa	No data available
Vapor density	kPa (Air = 1)	No data available
Evaporation Rate	(n-Butyl acetate = 1)	No data available
Water Solubility @ 25°C	mg/l	3574
Solubility in other solvents Partition coefficient (Log Pow)	(n-octanol/water)	1.87
Coefficient of Thermal Expansion	per Deg C	No data available
Particle Characteristics	-	No data available
Color	-	White
Explosive properties	-	Not explosive

The values listed are indicative of this product's physical and chemical properties. For a full product specification, please consult the Product Data Sheet.

10. STABILITY AND REACTIVITY

Reactivity

The product is non-reactive under normal conditions of use, storage and transport.

Chemical stability

Stable under normal conditions.

Possibility of hazardous reactions

No dangerous reactions known under normal conditions of use.

Conditions to avoid

Incompatible materials. Avoid excessive heat for prolonged periods of time.

Incompatible materials

Strong oxidizing agents.

Hazardous decomposition products

Carbon oxides (CO, CO₂). Phosphorus oxides.

11. TOXICOLOGICAL INFORMATION

Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral) : Not classified

Acute toxicity (dermal) : Not classified

Acute toxicity (inhalation) : Not classified

6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
LD50 oral rat	> 2000 mg/kg bodyweight
LD50 dermal rat	> 2000 mg/kg bodyweight

Skin corrosion/irritation: Not classified

Serious eye damage/irritation: Not classified

Respiratory or skin sensitisation: May cause an allergic skin reaction.

Germ cell mutagenicity: Not classified
Carcinogenicity: Not classified
Reproductive toxicity: Not classified
STOT-single exposure: Not classified
STOT-repeated exposure: Not classified
Aspiration hazard: Not classified

Information on other hazards**Endocrine disrupting properties**

Adverse health effects caused by endocrine disrupting properties: The substance/mixture has no endocrine disrupting properties.

Other information

No additional information available

12. ECOLOGICAL INFORMATION**Toxicity**

Ecology - general: The product is not considered harmful to aquatic organisms nor to cause long-term adverse effects in the environment.

Hazardous to the aquatic environment, short term (acute): Not classified

Hazardous to the aquatic environment, long-term(chronic): Not classified

Not rapidly degradable

6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
LC50 96h - Fish [1]	> 100 mg/l
EC50 72h - Algae [1]	110 mg/l

Persistence and degradability

6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
Persistence and degradability	The product is not biodegradable.

Bioaccumulative potential

6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
Partition coefficient n-octanol/water (Log Pow)	1.87

Mobility in soil

6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	1.56 (25 °C)

Results of PBT and vPvB assessment

6H-dibenz[c,e][1,2]oxaphosphorin 6-oxide (35948-25-5)	
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII	
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII	

Endocrine disrupting properties

Adverse effects on the environment caused by endocrine disrupting properties: The substance/mixture has no endocrine disrupting properties.

Other adverse effects

No additional information available

13. DISPOSAL CONSIDERATIONS**Disposal Methods****Waste treatment methods**

Waste treatment methods: Dispose of contents/container in accordance with licensed collector's sorting instructions.

14. TRANSPORT INFORMATION

Road and Rail Transport		Marine Transport		Air Transport	
UN. Number	Not Regulated	UN. Number	Not Regulated	UN. Number	Not Regulated
Class/Item	Not Regulated	Class/Item	Not Regulated	Class/Item	Not Regulated
Hazard Symbol	Not Regulated	Hazard Symbol	Not Regulated	Hazard Symbol	Not Regulated
Proper Shipping Name	Not Regulated	Proper Shipping Name	Not Regulated	Proper Shipping Name	Not Regulated
Packing Group	Not Regulated	Packing Group	Not Regulated	Packing Group	Not Regulated
		Marine Pollutant	Not Regulated		

15. REGULATORY INFORMATION

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

EU-Regulations**REACH Annex XVII (Restriction List)**

Not listed on REACH Annex XVII

REACH Annex XIV (Authorisation List)

Not listed on REACH Annex XIV (Authorisation List)

REACH Candidate List (SVHC)

Not listed on the REACH Candidate List

PIC Regulation (Prior Informed Consent)

Not listed on the PIC list (Regulation EU 649/2012)

POP Regulation (Persistent Organic Pollutants)

Not listed on the POP list (Regulation EU 2019/1021)

Ozone Regulation (1005/2009)

Not listed on the Ozone Depletion list (Regulation EU 1005/2009)

Explosives Precursors Regulation (2019/1148)

Contains no substance(s) listed on the Explosives Precursors list (Regulation EU 2019/1148 on the marketing and use of explosives precursors)

Drug Precursors Regulation (273/2004)

Contains no substance(s) listed on the Drug Precursors list (Regulation EC 273/2004 on the manufacture and the placing on market of certain substances used in the illicit manufacture of narcotic drugs and psychotropic substances)

National regulations**Germany**

Employment restrictions

: Observe restrictions according Act on the Protection of Working Mothers (MuSchG).

Observe restrictions according Act on the Protection of Young People in Employment (JArbSchG).

Water hazard class (WGK)

: Not classified according to Regulation Governing Systems for Handling Substances Hazardous to Waters (AwSV).

Storage class (LGK, TRGS 510)

: LGK 13 - Non-combustible solids.

Joint storage table

LGK 1	LGK 2A	LGK 2B	LGK 3	LGK 4.1A
LGK 4.1B	LGK 4.2	LGK 4.3	LGK 5.1A	LGK 5.1B
LGK 5.1C	LGK 5.2	LGK 6.1A	LGK 6.1B	LGK 6.1C
LGK 6.1D	LGK 6.2	LGK 7	LGK 8A	LGK 8B
LGK 10	LGK 11	LGK 12	LGK 13	LGK 10-13

Joint storage not permitted for

LGK 1, LGK 6.2, LGK 7.

Joint storage with restrictions permitted for

LGK 4.1A, LGK 5.1C.

Joint storage permitted for

LGK 2A, LGK 2B, LGK 3, LGK 4.1B, LGK 4.2, LGK 4.3, LGK 5.1A, LGK 5.1B, LGK 5.2, LGK 6.1A, LGK 6.1B, LGK 6.1C, LGK 6.1D, LGK 8A, LGK 8B, LGK 10, LGK 11, LGK 12, LGK 13, LGK 10-13.

Hazardous Incident Ordinance (12. BImSchV)

: Is not subject of the Hazardous Incident Ordinance (12. BImSchV)

Netherlands

ABM category

: B(4) - low hazard for aquatic organisms

SZW-lijst van kankerverwekkende stoffen

: The substance is not listed

SZW-lijst van mutagene stoffen

: The substance is not listed

SZW-lijst van reprotoxische stoffen –
Borstvoeding

: The substance is not listed

SZW-lijst van reprotoxische stoffen –
Vruchtbaarheid

: The substance is not listed

SZW-lijst van reprotoxische stoffen –
Ontwikkeling

: The substance is not listed

Denmark

Danish National Regulations

: Young people below the age of 18 years are not allowed to use the product

Switzerland

Storage class (LK)

: LK 11/13 - Solids

Chemical safety assessment

No chemical safety assessment has been carried out.

16. OTHER INFORMATIONNational Fire Protection
Association (USA)

:

No data available.

SDS Distribution

:

The information contained herein is based on our current knowledge of the underlying data and is intended to describe the product for the purpose of health, safety and environmental requirements only. No warranty of guarantee is expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product.

Prepared By

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Quality Control Department / Global Chemie ASCC Limited.

Abbreviations:

AND: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road

ATE: Acute Toxicity Estimate

BCF: Bioconcentration factor

BLV: Biological limit value

BOD: Biochemical oxygen demand (BOD)

COD: Chemical oxygen demand (COD)

DMEL: Derived Minimal Effect level

DNEL: Derived-No Effect Level

EC-No.: European Community number

EC50: Median effective concentration

EN: European Standard

IARC: International Agency for Research on Cancer

IATA: International Air Transport Association

IMDG: International Maritime Dangerous Goods

LC50: Median lethal concentration

LD50: Median lethal dose

LOAEL: Lowest Observed Adverse Effect Level

NOAEC: No-Observed Adverse Effect Concentration

NOAEL: No-Observed Adverse Effect Level

NOEC: No-Observed Effect Concentration

OECD: Organisation for Economic Co-operation and Development

OEL: Occupational Exposure Limit

PBT: Persistent Bioaccumulative Toxic

PNEC: Predicted No-Effect Concentration

RID: Regulations concerning the International Carriage of Dangerous Goods by Rail

SDS: Safety Data Sheet

STP: Sewage treatment plant

ThOD: Theoretical oxygen demand (ThOD)

TLM: Median Tolerance Limit

VOC: Volatile Organic Compounds

CAS-No. Chemical Abstract Service number

N.O.S. Not Otherwise Specified

vPvB: Very Persistent and Very Bioaccumulative

ED: Endocrine disrupting properties

References:

- Supplier Material Safety Data Sheets.

The information sourced for the preparation of this document was correct and complete at the time of writing to the best of the writer's knowledge. The document represents the commitment to the company's responsibilities surrounding the supply of this product, undertaken in good faith. This document should be taken as a safety guide for the product and its recommended uses but is in no way an absolute authority. Please consult the relevant legislation and regulations governing the use and storage of this type of product. No warranty and guarantee are expressed or implied regarding the accuracy of these data or the results to be obtained from the use of the product for further information, please contact Global Chemie ASCC Limited.