



## DICYCLOHEXYLPHOSPHINE

Safety Data Sheet OMPH018

Date of issue: 18/12/2015 Version: 1.0

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

#### 1.1. Product identifier

Product form : Substance  
 Physical state : Liquid  
 Substance name : DICYCLOHEXYLPHOSPHINE  
 Product code : OMPH018  
 Formula : C12H23P  
 Chemical family : ORGANOPHOSPHORUS COMPOUND

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

##### 1.2.1. Relevant identified uses

Use of the substance/mixture : Chemical intermediate

##### 1.2.2. Uses advised against

No additional information available

#### 1.3. Details of the supplier of the safety data sheet

##### GELEST, INC.

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#### 1.4. Emergency telephone number

Emergency number : CHEMTREC: 1-800-424-9300 (USA); +1 703-527-3887 (International)

### SECTION 2: Hazards identification

#### 2.1. Classification of the substance or mixture

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

Pyrophoric Liquids, Category 1	H250
Acute toxicity (oral), Category 3	H301
Skin corrosion/irritation, Category 1B	H314
Serious eye damage/eye irritation, Category 1	H318
Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation	H335
Full text of H statements : see section 16	

##### Adverse physicochemical, human health and environmental effects

No additional information available

#### 2.2. Label elements

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

Hazard pictograms (CLP) :



GHS02

GHS05

GHS06

Signal word (CLP) : Danger

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Hazard statements (CLP)	: H250 - Catches fire spontaneously if exposed to air. H301 - Toxic if swallowed. H314 - Causes severe skin burns and eye damage. H335 - May cause respiratory irritation.
Precautionary statements (CLP)	: P280 - Wear protective gloves/protective clothing/eye protection/face protection. P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P222 - Do not allow contact with air. P264 - Wash hands thoroughly after handling. P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting. P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER.

### 2.3. Other hazards

No additional information available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Substance type	: Mono-constituent
Name	: DICYCLOHEXYLPHOSPHINE
CAS-No.	: 829-84-5
EC-No.	: 212-590-9

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
Dicyclohexylphosphine	(CAS-No.) 829-84-5 (EC-No.) 212-590-9	95 - 100	Pyr. Liq. 1, H250 Acute Tox. 3 (Oral), H301 Skin Corr. 1B, H314 Eye Dam. 1, H318 STOT SE 3, H335

Full text of H-statements: see section 16

### 3.2. Mixtures

Not applicable

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

First-aid measures general	: Remove contaminated clothing and shoes. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). If possible show this sheet; if not available show packaging or label.
First-aid measures after inhalation	: Remove person to fresh air and keep comfortable for breathing. If you feel unwell, seek medical advice.
First-aid measures after skin contact	: Wash with plenty of water/.... Get immediate medical advice/attention.
First-aid measures after eye contact	: Immediately flush eyes thoroughly with water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical advice/attention.
First-aid measures after ingestion	: Never give anything by mouth to an unconscious person. Immediately call a POISON CENTER/doctor.

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

Symptoms/effects	: Causes severe skin burns and eye damage.
Symptoms/effects after inhalation	: May cause respiratory irritation. Direct respiratory contact is usually not possible, but will cause burns. Inhalation of combustion products can cause irritation.
Symptoms/effects after skin contact	: Causes (severe) skin burns.
Symptoms/effects after eye contact	: Causes serious eye damage.
Symptoms/effects after ingestion	: Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard.

### 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	: Dry chemical powder followed by sand or dolomite.
Unsuitable extinguishing media	: Do not use straight streams.

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### 5.2. Special hazards arising from the substance or mixture

Fire hazard : Pyrophoric liquid. Irritating fumes and organic acid vapors may develop when material is exposed to elevated temperatures or open flame.

### 5.3. Advice for firefighters

Firefighting instructions : Exercise caution when fighting any chemical fire. In contact with combustible materials such as paper and textiles, ignites spontaneously in air.

Protection during firefighting : Do not enter fire area without proper protective equipment, including respiratory protection. Avoid all eye and skin contact and do not breathe vapour and mist.

Other information : PYROPHORIC- MAY IGNITE SPONTANEOUSLY ON CONTACT WITH AIR.

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

General measures : Laboratory and production areas must be equipped with special fire-extinguishing media for pyrophorics.

#### 6.1.1. For non-emergency personnel

Protective equipment : Wear protective equipment as described in Section 8.

Emergency procedures : Evacuate unnecessary personnel.

#### 6.1.2. For emergency responders

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

### 6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

### 6.3. Methods and material for containment and cleaning up

For containment : Contain any spills with dikes or absorbents to prevent migration and entry into sewers or streams.

Methods for cleaning up : Cover with dry chemical extinguishing powder, lime, sand or soda ash. Remove sources of ignition. Remove combustible materials in the vicinity of the spill. Allow time for decomposition or fire to burn out, then sweep material and transfer to a suitable container for disposal.

### 6.4. Reference to other sections

See Heading 8. Exposure controls and personal protection.

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Additional hazards when processed : Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. PYROPHORIC- MAY IGNITE SPONTANEOUSLY ON CONTACT WITH AIR. Product will ignite spontaneously if heated.

Precautions for safe handling : Avoid all eye and skin contact and do not breathe vapour and mist. Do not allow contact with air. Use only outdoors or in a well-ventilated area.

Hygiene measures : Wash contaminated clothing before reuse. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.

### 7.2. Conditions for safe storage, including any incompatibilities

Technical measures : Laboratory and production areas must be equipped with special fire-extinguishing media for pyrophorics.

Storage conditions : Keep container tightly closed. Store locked up. Store in sealed containers under inert atmosphere.

Incompatible materials : Alkalis. Bromine. Chlorine. Metal salts. Oxidizing agent. Precious metals.

Storage area : Store in a well-ventilated place. Store away from heat.

### 7.3. Specific end use(s)

No additional information available

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

No additional information available

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### 8.2. Exposure controls

#### Appropriate engineering controls:

Provide local exhaust or general room ventilation.

#### Personal protective equipment:

Avoid all unnecessary exposure. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure.

#### Hand protection:

Neoprene or nitrile rubber gloves

#### Eye protection:

Full face shield with chemical workers goggles. Contact lenses should not be worn

#### Skin and body protection:

Wear suitable protective clothing

#### Respiratory protection:

Where exposure through inhalation may occur from use, respiratory protection equipment is recommended. NIOSH-certified organic vapor (black cartridge) respirator.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state	: Liquid
Appearance	: Liquid. Fumes and ignites in air.
Molecular mass	: 198.29 g/mol
Colour	: Clear to amber.
Odour	: Disagreeable. Pungent.
Odour threshold	: No data available
Refractive index	: 1.516
pH	: No data available
Relative evaporation rate (butylacetate=1)	: No data available
Melting point	: 2 °C
Freezing point	: No data available
Boiling point	: 129 °C @ 8 mm Hg
Flash point	: 110 °C
Auto-ignition temperature	: No data available
Decomposition temperature	: No data available
Flammability (solid, gas)	: Pyrophoric liquid, Catches fire spontaneously if exposed to air.
Vapour pressure	: < 0.1 mm Hg @ 25°C
Relative vapour density at 20 °C	: > 1
Relative density	: 0.98
Solubility	: Insoluble in water. Reacts slowly with water.
Log Pow	: No data available
Log Kow	: No data available
Viscosity, kinematic	: No data available
Viscosity, dynamic	: No data available
Explosive properties	: No data available
Oxidising properties	: No data available
Explosive limits	: No data available

### 9.2. Other information

No additional information available

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Reacts violently with dimethylsulfoxide.

### 10.2. Chemical stability

Stable in sealed containers under dry inert atmosphere. Oxidizes in air. Will ignite spontaneously in contact with high surface area combustibles such as paper and textiles.

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### 10.3. Possibility of hazardous reactions

No additional information available

### 10.4. Conditions to avoid

Contact with air and oxygen should be avoided.

### 10.5. Incompatible materials

Alkalis. Bromine. Chlorine. Metal salts. Oxidizing agent. Precious metals.

### 10.6. Hazardous decomposition products

Organic phosphine vapors. Phosphorus oxides.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity : Toxic if swallowed.

#### DICYCLOHEXYLPHOSPHINE (829-84-5)

ATE CLP (oral)	215 mg/kg bodyweight
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#### Dicyclohexylphosphine (829-84-5)

LD50 oral rat	215 mg/kg
ATE CLP (oral)	215 mg/kg bodyweight

Skin corrosion/irritation : Causes severe skin burns and eye damage.  
Serious eye damage/irritation : Causes serious eye damage.  
Respiratory or skin sensitisation : Not classified  
Germ cell mutagenicity : Not classified  
Carcinogenicity : Not classified  
Reproductive toxicity : Not classified  
STOT-single exposure : May cause respiratory irritation.  
STOT-repeated exposure : Not classified  
Aspiration hazard : Not classified  
Symptoms/effects after inhalation : May cause respiratory irritation. Direct respiratory contact is usually not possible, but will cause burns. Inhalation of combustion products can cause irritation.  
Symptoms/effects after skin contact : Causes (severe) skin burns.  
Symptoms/effects after eye contact : Causes serious eye damage.  
Symptoms/effects after ingestion : Toxic if swallowed. Swallowing a small quantity of this material will result in serious health hazard.  
Reason for classification : Expert judgment

## SECTION 12: Ecological information

### 12.1. Toxicity

Acute aquatic toxicity : Not classified  
Chronic aquatic toxicity : Not classified

### 12.2. Persistence and degradability

No additional information available

### 12.3. Bioaccumulative potential

No additional information available

### 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 : This substance may be hazardous to the environment.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Sewage disposal recommendations : Do not dispose of waste into sewer.  
Product/Packaging disposal recommendations : Incinerate. Dispose in a safe manner in accordance with local/national regulations. Dispose of contents/container to licensed waste disposal facility. This is a RCRA hazardous waste: 40 CFR 261.21 (i.e. ignitable) 40 CFR 261.23 (i.e. reactive).

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Ecology - waste materials : Avoid release to the environment.

### SECTION 14: Transport information

#### 14.1. UN number

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

#### 14.1. UN number

UN-No. (ADR) : 2845  
UN-No. (IMDG) : 2845  
UN-No. (IATA) : 2845  
UN-No. (ADN) : 2845  
UN-No. (RID) : 2845

#### 14.2. UN proper shipping name

Proper Shipping Name (ADR) : PYROPHORIC LIQUID, ORGANIC, N.O.S.  
Proper Shipping Name (IMDG) : PYROPHORIC LIQUID, ORGANIC, N.O.S.  
Proper Shipping Name (IATA) : Pyrophoric liquid, organic, n.o.s.  
Proper Shipping Name (ADN) : PYROPHORIC LIQUID, ORGANIC, N.O.S.  
Proper Shipping Name (RID) : PYROPHORIC LIQUID, ORGANIC, N.O.S.  
Transport document description (ADR) : UN 2845 PYROPHORIC LIQUID, ORGANIC, N.O.S. (DICYCLOHEXYLPHOSPHINE), 4.2, I, (B/E)  
Transport document description (IMDG) : UN 2845 PYROPHORIC LIQUID, ORGANIC, N.O.S. (DICYCLOHEXYLPHOSPHINE), 4.2, I  
Transport document description (IATA) : UN 2845 Pyrophoric liquid, organic, n.o.s. (DICYCLOHEXYLPHOSPHINE), 4.2  
Transport document description (ADN) : UN 2845 PYROPHORIC LIQUID, ORGANIC, N.O.S. (DICYCLOHEXYLPHOSPHINE), 4.2, I  
Transport document description (RID) : UN 2845 PYROPHORIC LIQUID, ORGANIC, N.O.S. (DICYCLOHEXYLPHOSPHINE), 4.2, I

#### 14.3. Transport hazard class(es)

##### ADR

Transport hazard class(es) (ADR) : 4.2  
Danger labels (ADR) : 4.2



##### IMDG

Transport hazard class(es) (IMDG) : 4.2  
Danger labels (IMDG) : 4.2



##### IATA

Transport hazard class(es) (IATA) : 4.2

##### ADN

Transport hazard class(es) (ADN) : 4.2  
Danger labels (ADN) : 4.2



##### RID

Transport hazard class(es) (RID) : 4.2



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Danger labels (RID) : 4.2



### 14.4. Packing group

Packing group (ADR) : I  
Packing group (IMDG) : I  
Packing group (IATA) : Not applicable  
Packing group (ADN) : I  
Packing group (RID) : I

### 14.5. Environmental hazards

Dangerous for the environment : No  
Marine pollutant : No  
Other information : No supplementary information available

### 14.6. Special precautions for user

#### - Overland transport

Classification code (ADR) : S1  
Special provisions (ADR) : 274  
Limited quantities (ADR) : 0  
Excepted quantities (ADR) : E0  
Packing instructions (ADR) : P400  
Mixed packing provisions (ADR) : MP2  
Portable tank and bulk container instructions (ADR) : T22  
Portable tank and bulk container special provisions (ADR) : TP2, TP7  
Tank code (ADR) : L21DH  
Tank special provisions (ADR) : TU14, TC1, TE21, TM1  
Vehicle for tank carriage : AT  
Transport category (ADR) : 0  
Special provisions for carriage - Packages (ADR) : V1  
Special provisions for carriage - Operation (ADR) : S20  
Hazard identification number (Kemler No.) : 333  
Orange plates :

333

2845

Tunnel restriction code (ADR) : B/E

#### - Transport by sea

Special provisions (IMDG) : 274  
Limited quantities (IMDG) : 0  
Excepted quantities (IMDG) : E0  
Packing instructions (IMDG) : P400  
Special packing provisions (IMDG) : PP31  
Tank instructions (IMDG) : T22  
Tank special provisions (IMDG) : TP2, TP7  
EmS-No. (Fire) : F-G  
EmS-No. (Spillage) : S-M  
Stowage category (IMDG) : D  
Stowage and handling (IMDG) : H1  
Segregation (IMDG) : SG63, SG26

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Properties and observations (IMDG) : Highly flammable liquids, may ignite spontaneously in moist air. In contact with air, evolve irritating and slightly toxic fumes.

### - Air transport

PCA Limited quantities (IATA) : Forbidden  
PCA limited quantity max net quantity (IATA) : Forbidden  
PCA packing instructions (IATA) : Forbidden  
PCA max net quantity (IATA) : Forbidden  
CAO packing instructions (IATA) : Forbidden  
CAO max net quantity (IATA) : Forbidden  
ERG code (IATA) : 4W

### - Inland waterway transport

Classification code (ADN) : S1  
Special provisions (ADN) : 274  
Limited quantities (ADN) : 0  
Excepted quantities (ADN) : E0  
Equipment required (ADN) : PP  
Number of blue cones/lights (ADN) : 0

### - Rail transport

Classification code (RID) : S1  
Special provisions (RID) : 274  
Limited quantities (RID) : 0  
Excepted quantities (RID) : E0  
Packing instructions (RID) : P400  
Mixed packing provisions (RID) : MP2  
Portable tank and bulk container instructions (RID) : T22  
Portable tank and bulk container special provisions (RID) : TP2, TP7  
Tank codes for RID tanks (RID) : L21DH  
Special provisions for RID tanks (RID) : TU14, TU38, TC1, TE21, TE22, TE25, TM1  
Transport category (RID) : 0  
Special provisions for carriage – Packages (RID) : W1  
Hazard identification number (RID) : 333

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

## SECTION 15: Regulatory information

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

#### 15.1.1. EU-Regulations

No REACH Annex XVII restrictions

DICYCLOHEXYLPHOSPHINE is not on the REACH Candidate List

DICYCLOHEXYLPHOSPHINE is not on the REACH Annex XIV List

DICYCLOHEXYLPHOSPHINE is not subject to REGULATION (EU) No 649/2012 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 4 July 2012 concerning the export and import of hazardous chemicals.

DICYCLOHEXYLPHOSPHINE is not subject to Regulation (EC) No 850/2004 of the European Parliament and of the Council of 29 April 2004 on persistent organic pollutants and amending Directive 79/117/EEC

#### 15.1.2. National regulations

##### Germany

12th Ordinance Implementing the Federal Immission Control Act - 12.BImSchV : Is not subject of the 12. BImSchV (Hazardous Incident Ordinance)

##### Netherlands

SZW-lijst van kankerverwekkende stoffen : The substance is not listed

SZW-lijst van mutagene stoffen : The substance is not listed



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NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Borstvoeding : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige stoffen – Vruchtbaarheid : The substance is not listed

NIET-limitatieve lijst van voor de voortplanting giftige 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

### 15.2. Chemical safety assessment

No additional information available

## SECTION 16: Other information

Abbreviations and acronyms:

	Abbreviations: ND: Not Determined, No Data; NA: Not Applicable; LD: Lethal Dose; LC: Lethal Concentration; ATE: Acute Toxicity Estimates; H: hour; °: °C unless otherwise stated; mm: millimeters Hg, torr; PEL: permissible exposure level; TWA: time weighted average; TLV: threshold limit value; TG: Test Guideline; NIOSH: National Institute for Occupational Safety and Health; IARC: International Agency for Research on Cancer; NTP: National Toxicology Program; HMIS: Hazardous Material Information System; CAS No.: Chemical Abstract Service Registration Number; EC No.: European Commission Registration Number; EC Index No.: European Commission Index Number; OECD: The Organisation for Economic Co-operation and Development; GHS: The Globally Harmonized System of Classification and Labelling; APF: Assigned Protection Factor
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Other information : Prepared by safety and environmental affairs.

Full text of H- and EUH-statements:

Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Eye Dam. 1	Serious eye damage/eye irritation, Category 1
Pyr. Liq. 1	Pyrophoric Liquids, Category 1
Skin Corr. 1B	Skin corrosion/irritation, Category 1B
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Respiratory tract irritation
H250	Catches fire spontaneously if exposed to air.
H301	Toxic if swallowed.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.

SDS EU (REACH Annex II) - Custom

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