

Chemical Safety Data Sheet MSDS / SDS

Phosphorus SDS

Revision Date:2024-04-25 Revision Number:1

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

Product name: Phosphorus

CAS: 7723-14-0

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

Relevant identified uses: For R&D use only. Not for medicinal, household or other use.

Uses advised against: none

Company Identification

Company: Chemicalbook.in

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SECTION 2: Hazards identification**Classification of the substance or mixture**

Flammable solids, Category 1

Hazardous to the aquatic environment, long-term (Chronic) - Category Chronic 3

GHS label elements, including precautionary statements

Pictogram(s)



Signal word

Danger

Hazard statement(s)

H228 Flammable solid

H412 Harmful to aquatic life with long lasting effects

Precautionary statement(s)

Prevention

P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting/...] equipment.

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

P273 Avoid release to the environment.

Response

P370+P378 In case of fire: Use ... to extinguish.

Storage

none

Disposal

P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Other hazards which do not result in classification

no data available

SECTION 3: Composition/information on ingredients

Substance

Chemical name:	Phosphorus
Common names and synonyms:	Phosphorus
CAS number:	7723-14-0
EC number:	231-768-7
Concentration:	100%

SECTION 4: First aid measures

Description of necessary first-aid measures

If inhaled

Move the victim into fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration and consult a doctor immediately. Do not use mouth to mouth resuscitation if the victim ingested or inhaled the chemical.

Following skin contact

Take off contaminated clothing immediately. Wash off with soap and plenty of water. Consult a doctor.

Following eye contact

Rinse with pure water for at least 15 minutes. Consult a doctor.

Following ingestion

Rinse mouth with water. Do not induce vomiting. Never give anything by mouth to an unconscious person. Call a doctor or Poison Control Center immediately.

Most important symptoms/effects, acute and delayed

Solid or liquid causes severe burns of skin. If ingested, causes nausea, vomiting, jaundice, low blood pressure, depression, delirium, coma, death. Symptoms after ingestion may be delayed for from a few hours to 3 days. (USCG, 1999)
Excerpt from ERG Guide 136 [Substances - Spontaneously Combustible - Toxic and/or Corrosive (Air-Reactive)]: Fire will produce irritating, corrosive and/or toxic gases. TOXIC; ingestion of substance or inhalation of decomposition products will cause severe injury or death. Contact with substance may cause severe burns to skin and eyes. Some effects may be experienced due to skin absorption. Runoff from fire control may be corrosive and/or toxic and cause pollution. (ERG, 2016)

Indication of immediate medical attention and special treatment needed, if necessary

no data available

SECTION 5: Firefighting measures

Suitable extinguishing media

Excerpt from ERG Guide 136 [Substances - Spontaneously Combustible - Toxic and/or Corrosive (Air-Reactive)]: SMALL FIRE: Water spray, wet sand or wet earth. LARGE FIRE: Water spray or fog. Do not scatter spilled material with high-pressure water streams. Move containers from fire area if you can do it without risk. FIRE INVOLVING TANKS OR CAR/TRAILER LOADS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles. Cool containers with flooding quantities of water until well after fire is out. Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank. ALWAYS stay away from tanks engulfed in fire. (ERG, 2016)

Specific hazards arising from the chemical

Special Hazards of Combustion Products: Fumes from burning phosphorus are highly irritating. Behavior in Fire: Intense white smoke is formed. (USCG, 1999)

Excerpt from ERG Guide 136 [Substances - Spontaneously Combustible - Toxic and/or Corrosive (Air-Reactive)]: Extremely flammable; will ignite itself if exposed to air. Burns rapidly, releasing dense, white, irritating fumes. Substance may be transported in a molten form. May re-ignite after fire is extinguished. Corrosive substances in contact with metals may produce flammable hydrogen gas. Containers may explode when heated. (ERG, 2016)

Special protective actions for fire-fighters

Wear self-contained breathing apparatus for firefighting if necessary.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Avoid dust formation. Avoid breathing mist, gas or vapours. Avoid contacting with skin and eye. Use personal protective equipment. Wear chemical impermeable gloves. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas. Keep people away from and upwind of spill/leak.

Environmental precautions

Prevent further spillage or leakage if it is safe to do so. Do not let the chemical enter drains. Discharge into the environment must be avoided.

Methods and materials for containment and cleaning up

Collect and arrange disposal. Keep the chemical in suitable and closed containers for disposal. Remove all sources of ignition. Use spark-proof tools and explosion-proof equipment. Adhered or collected material should be promptly disposed of, in accordance with appropriate laws and regulations.

SECTION 7: Handling and storage

Precautions for safe handling

Handling in a well ventilated place. Wear suitable protective clothing. Avoid contact with skin and eyes. Avoid formation of dust and aerosols. Use non-sparking tools. Prevent fire caused by electrostatic discharge steam.

Conditions for safe storage, including any incompatibilities

Store the container tightly closed in a dry, cool and well-ventilated place. Store apart from foodstuff containers or incompatible materials.

SECTION 8: Exposure controls/personal protection

Control parameters

Occupational Exposure limit values

Component	Phosphorus			
	CAS No. 7723-14-0			
	Limit value - Eight hours		Limit value - Short term	
	ppm	mg/m ³	ppm	mg/m ³
Australia	?	0,1	?	?
Belgium	0,02	0,1	?	?
Canada - Québec	?	0,1	?	?
Denmark	?	0,1	?	0,2
Germany (AGS)	?	0,01 inhalable aerosol	?	0,02 inhalable aerosol (1)
Germany (DFG)	?	0,01 inhalable aerosol	?	0,02 inhalable aerosol (1)
Hungary	?	0,1	?	0,1
Ireland	?	0,1	?	0,3 (1)
Japan - JSOH	?	0,1	?	?
Latvia	?	0,03	?	?
New Zealand	?	0,1 (1)	?	?
People's Republic of China	?	0,05	?	0,1 (1)
Singapore	0,02	0,1	?	?

South Korea	?	0,1	?	?
Switzerland	?	0,02 inhalable aerosol	?	0,02 inhalable aerosol
USA - NIOSH	?	0,1	?	?
USA - OSHA	?	?	?	0,1
	Remarks			
Germany (AGS)	(1) 15 minutes average value			
Germany (DFG)	(1) 15 minutes average value			
Ireland	(1) 15 minutes reference period			
New Zealand	(1) yellow			
People's Republic of China	(1) 15 minutes average value			
USA - OSHA	Yellow phosphorus			

Biological limit values

no data available

Appropriate engineering controls

Ensure adequate ventilation. Handle in accordance with good industrial hygiene and safety practice. Set up emergency exits and the risk-elimination area.

Individual protection measures, such as personal protective equipment (PPE)

Eye/face protection

Wear tightly fitting safety goggles with side-shields conforming to EN 166(EU) or NIOSH (US).

Skin protection

Wear fire/flame resistant and impervious clothing. Handle with gloves. Gloves must be inspected prior to use. Wash and dry hands. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it.

Respiratory protection

If the exposure limits are exceeded, irritation or other symptoms are experienced, use a full-face respirator.

Thermal hazards

no data available

SECTION 9: Physical and chemical properties and safety characteristics

Physical state:	Phosphorus, white, dry or under water or in solution is a soft waxy solid with a sharp pungent odor similar to garlic. Insoluble in water and ethyl alcohol. Soluble in carbon disulfide. Shipped as a solid or liquid in an atmosphere of inert gas or as a solid under water. Barely soluble in water and denser than water. Hence, sinks in water. Uses include munitions manufacture, pyrotechnics, explosives, smoke bombs, artificial fertilizers, and rat poisons. Density approximately 15.2 lb / gal.
Colour:	no data available
Odour:	no data available
Melting point/freezing point:	280°C (white)(lit.)
Boiling point or initial boiling point and boiling range:	280°C
Flammability:	no data available
Lower and upper explosion limit/flammability limit:	no data available
Flash point:	30°C
Auto-ignition temperature:	86° F (USCG, 1999)
Decomposition temperature:	no data available
pH:	no data available
Kinematic viscosity:	no data available
Solubility:	0.0003 % (NIOSH, 2016)
Partition coefficient n-octanol/water:	no data available
Vapour pressure:	0.03 mm Hg (21 °C)

Density and/or relative density:	2.34 g/mL at 25°C(lit.)
Relative vapour density:	0.02 (vs air)
Particle characteristics:	no data available

SECTION 10: Stability and reactivity

Reactivity

Phosphorus spontaneously ignites on contact with air, producing toxic fumes (phosphorus oxides). Phosphorus reacts violently with oxidants, halogens, some metals, nitrites, sulfur, and many other compounds, causing a fire and explosion hazard. Phosphorus reacts with strong bases to produce toxic phosphine gas.

Chemical stability

no data available

Possibility of hazardous reactions

WHITE PHOSPHORUS reacts readily with most oxidizing agents. Often ignites on contact with air; storage under water prevents this reaction. Submersion in water stops the white phosphorus/air reaction which however usually resumes when the water is removed. Reacts violently with bromine trifluoride, even at 10°C [Mellor 2:113. 1946-47]. Reacts explosively on contact with bromazide. Reacts explosively with selenium oxychloride, evolving light and heat [Mellor 10:906. 1946-47]. Can also serve as an oxidizing agent---reacts incandescently if heated with thorium [Svenska Akad. 1829. p. 1].

Conditions to avoid

no data available

Incompatible materials

AIR AND WATER REACTIONS: Reacts with oxygen and water or water vapor to form phosphine. CHEMICAL PROFILE: Large quantities ignite spontaneously and on exposure to oxidizing agent. (REACTIVITY, 1999)

Hazardous decomposition products

no data available

SECTION 11: Toxicological information

Acute toxicity

Oral: no data available

Inhalation: no data available

Dermal: no data available

Skin corrosion/irritation

no data available

Serious eye damage/irritation

no data available

Respiratory or skin sensitization

no data available

Germ cell mutagenicity

no data available

Carcinogenicity

EPA: Not classifiable as to human carcinogenicity. IARC: Not evaluated. NTP: Not evaluated

Reproductive toxicity

No information is available on the reproductive or developmental effects of white phosphorus in humans. An animal study reported a high maternal mortality rate from oral exposure to white phosphorus.

STOT-single exposure

no data available

STOT-repeated exposure

no data available

Aspiration hazard

no data available

SECTION 12: Ecological information

Toxicity

Toxicity to fish: no data available

Toxicity to daphnia and other aquatic invertebrates: no data available

Toxicity to algae: no data available

Toxicity to microorganisms: no data available

Persistence and degradability

no data available

Bioaccumulative potential

no data available

Mobility in soil

no data available

Other adverse effects

no data available

SECTION 13: Disposal considerations

Disposal methods

Product

The material can be disposed of by removal to a licensed chemical destruction plant or by controlled incineration with flue gas scrubbing. Do not contaminate water, foodstuffs, feed or seed by storage or disposal. Do not discharge to sewer systems.

Contaminated packaging

Containers can be triply rinsed (or equivalent) and offered for recycling or reconditioning. Alternatively, the packaging can be punctured to make it unusable for other purposes and then be disposed of in a sanitary landfill. Controlled incineration with flue gas scrubbing is possible for combustible packaging materials.

SECTION 14: Transport information

UN Number

ADR/RID: UN1338 (For reference only, please check.)

IMDG: UN1338 (For reference only, please check.)

IATA: UN1338 (For reference only, please check.)

UN Proper Shipping Name

ADR/RID: PHOSPHORUS, AMORPHOUS (For reference only, please check.)

IMDG: PHOSPHORUS, AMORPHOUS (For reference only, please check.)

IATA: PHOSPHORUS, AMORPHOUS (For reference only, please check.)

Transport hazard class(es)

ADR/RID: 4.1 (For reference only, please check.)

IMDG: 4.1 (For reference only, please check.)

IATA: 4.1 (For reference only, please check.)

Packing group, if applicable

ADR/RID: III (For reference only, please check.)

IMDG: III (For reference only, please check.)

IATA: III (For reference only, please check.)

Environmental hazards

ADR/RID: No

IMDG: No

IATA: No

Special precautions for user

no data available

Transport in bulk according to IMO instruments

no data available

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

European Inventory of Existing Commercial Chemical Substances (EINECS)

Listed.

EC Inventory

Listed.

United States Toxic Substances Control Act (TSCA) Inventory

Listed.

China Catalog of Hazardous chemicals 2015

Listed.

New Zealand Inventory of Chemicals (NZIoC)

Listed.

(PICCS)

Listed.

Vietnam National Chemical Inventory

Listed.

IECSC)

Listed.

Korea Existing Chemicals List (KECL)

Listed.

SECTION 16: Other information

Abbreviations and acronyms

CAS: Chemical Abstracts Service

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

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

IMDG: International Maritime Dangerous Goods

IATA: International Air Transportation Association

TWA: Time Weighted Average

STEL: Short term exposure limit

LC50: Lethal Concentration 50%

LD50: Lethal Dose 50%

EC50: Effective Concentration 50%

References

IPCS - The International Chemical Safety Cards (ICSC), website: <http://www.ilo.org/dyn/icsc/showcard.home>

HSDB - Hazardous Substances Data Bank, website: <https://toxnet.nlm.nih.gov/newtoxnet/hsdb.htm>

IARC - International Agency for Research on Cancer, website: <http://www.iarc.fr/>

eChemPortal - The Global Portal to Information on Chemical Substances by OECD, website: http://www.echemportal.org/echemportal/index?pageID=0&request_locale=en

CAMEO Chemicals, website: <http://cameochemicals.noaa.gov/search/simple>

ChemIDplus, website: <http://chem.sis.nlm.nih.gov/chemidplus/chemidlite.jsp>

ERG - Emergency Response Guidebook by U.S. Department of Transportation, website: <http://www.phmsa.dot.gov/hazmat/library/erg>

Germany GESTIS-database on hazard substance, website: <http://www.dguv.de/ifa/gestis/gestis-stoffdatenbank/index-2.jsp>

ECHA - European Chemicals Agency, website: <https://echa.europa.eu/>

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