



SAFETY DATA SHEET

1. Identification

Product identifier	Lindane
Other means of identification	
Catalog number	1367504
CAS number	58-89-9
Synonyms	Gamma benzene hexachloride
Chemical name	γ -1,2,3,4,5,6-Hexachlorocyclohexane
Recommended use	For analytical laboratory use only.
Recommended restrictions	Not for use as a drug. Not for administration to humans or animals.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

Company name	U. S. Pharmacopeia
Address	12601 Twinbrook Parkway Rockville MD 20852-1790 United States
Telephone	Technical Services 301-816-8129
Website	www.usp.org
E-mail	RSTECH@usp.org
Emergency phone number	CHEMTREC within US & 1-800-424-9300 Canada CHEMTREC outside US & +1 703-527-3887 Canada

2. Hazard(s) identification

Physical hazards	Not classified.	
Health hazards	Acute toxicity, oral	Category 3
	Acute toxicity, dermal	Category 1
	Acute toxicity, inhalation	Category 4
	Germ cell mutagenicity	Category 1B
	Carcinogenicity	Category 1
	Reproductive toxicity	Effects on or via lactation
	Specific target organ toxicity, repeated exposure	Category 2
Environmental hazards	Not classified.	
OSHA defined hazards	Not classified.	
Label elements		



Signal word Danger

Hazard statement Toxic if swallowed. Fatal in contact with skin. Harmful if inhaled. May cause genetic defects. May cause cancer. May cause harm to breast-fed children. May cause damage to organs through prolonged or repeated exposure.

Precautionary statement

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wash thoroughly after handling. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Avoid contact during pregnancy/while nursing. Wear protective gloves/protective clothing/eye protection/face protection. Use only outdoors or in a well-ventilated area.

Response

If swallowed: Immediately call a poison center/doctor. Rinse mouth. If on skin: Wash with plenty of water. Immediately call a poison center/doctor. Take off immediately all contaminated clothing and wash it before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. If exposed or concerned: Get medical advice/attention.

Storage

Store locked up.

Disposal

Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)

None known.

Supplemental information

Pharmacologically active material.

3. Composition/information on ingredients

Substance

Chemical name	Common name and synonyms	CAS number	%
Lindane	Gamma benzene hexachloride	58-89-9	100

4. First-aid measures

Inhalation

If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if the substance is inhaled. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a poison center or doctor/physician if you feel unwell.

Skin contact

Remove contaminated clothing. Rinse skin with water/shower. Call a physician or poison control center immediately. Wash contaminated clothing before reuse.

Eye contact

Rinse with water. Get medical attention if irritation develops and persists.

Ingestion

Rinse mouth. If ingestion of a large amount does occur, call a poison control center immediately. Do not induce vomiting without advice from poison control center. Do not use mouth-to-mouth method if substance is ingested. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.

Most important symptoms/effects, acute and delayed

Central nervous system effects. Pharmacologically active material. Occupational exposure may cause physiological effects.

Indication of immediate medical attention and special treatment needed

Provide general supportive measures and treat symptomatically. Overdose treatment for lindane may include the following: Induced vomiting is not recommended since seizures may occur suddenly and without warning. Consider performing gastric lavage after ingestion of a potentially life-threatening amount of poison if it can be performed soon after ingestion (generally within 1 hour). Protect airway by placement in Trendelenburg and left lateral decubitus position or by endotracheal intubation. Control any seizures first. Administer activated charcoal as a slurry. For seizures, administer a benzodiazepine IV. Consider phenobarbital if seizures recur after diazepam. Monitor for hypotension, dysrhythmias, respiratory depression, and need for endotracheal intubation. Evaluate for hypoglycemia, electrolyte disturbances, hypoxia. For acute lung injury, maintain ventilation and oxygenation and evaluate with frequent arterial blood gas or pulse oximetry monitoring. Early use of PEEP and mechanical ventilation may be needed. Do NOT administer milk, fatty foods, or oils by mouth since these may enhance absorption of lindane. Do NOT administer adrenergic amines which may potentiate myocardial irritability. For dystonic reaction, administer benztropine or diphenhydramine intravenously.

General information

Remove from exposure. Remove contaminated clothing. For treatment advice, seek guidance from an occupational health physician or other licensed health-care provider familiar with workplace chemical exposures. In the United States, the national poison control center phone number is 1-800-222-1222. If person is not breathing, give artificial respiration. If breathing is difficult, give oxygen if available. Persons developing serious hypersensitivity (anaphylactic) reactions must receive immediate medical attention.

5. Fire-fighting measures

Suitable extinguishing media

Water. Foam. Dry chemical or CO2. Use fire-extinguishing media appropriate for surrounding materials.

Unsuitable extinguishing media

None known.

Specific hazards arising from the chemical	No unusual fire or explosion hazards noted.
Special protective equipment and precautions for firefighters	Wear suitable protective equipment.
Fire fighting equipment/instructions	Use water spray to cool unopened containers. As with all fires, evacuate personnel to a safe area. Firefighters should use self-contained breathing equipment and protective clothing.
Specific methods	Use standard firefighting procedures and consider the hazards of other involved materials.
General fire hazards	No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Wear appropriate personal protective equipment. Avoid inhalation of dust from the spilled material. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Avoid the generation of dusts during clean-up. Sweep up or vacuum up spillage and collect in suitable container for disposal. Clean surface thoroughly to remove residual contamination. For waste disposal, see section 13 of the SDS.
Environmental precautions	Avoid discharge into drains, water courses or onto the ground.

7. Handling and storage

Precautions for safe handling	As a general rule, when handling USP materials, avoid all contact and inhalation of dust, mists, and/or vapors associated with the material. Clean equipment and work surfaces with suitable detergent or solvent after use. After removing gloves, wash hands and other exposed skin thoroughly. Select and use containment devices and personal protective equipment based on a risk assessment of material potency and exposure potential.
Conditions for safe storage, including any incompatibilities	Store in tight container. This material should be handled and stored per label instructions to ensure product integrity.

8. Exposure controls/personal protection

Occupational exposure limits

The following constituents are the only constituents of the product which have a PEL, TLV or other recommended exposure limit. At this time, the other constituents have no known exposure limits.

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Material	Type	Value
Lindane (CAS 58-89-9)	PEL	0.5 mg/m3

US. ACGIH Threshold Limit Values

Material	Type	Value
Lindane (CAS 58-89-9)	TWA	0.5 mg/m3

US. NIOSH: Pocket Guide to Chemical Hazards

Material	Type	Value
Lindane (CAS 58-89-9)	TWA	0.5 mg/m3

Biological limit values	No biological exposure limits noted for the ingredient(s).
--------------------------------	--

Exposure guidelines

US - California OELs: Skin designation

Lindane (CAS 58-89-9)	Can be absorbed through the skin.
-----------------------	-----------------------------------

US - Minnesota Haz Subs: Skin designation applies

Lindane (CAS 58-89-9)	Skin designation applies.
-----------------------	---------------------------

US - Tennessee OELs: Skin designation

Lindane (CAS 58-89-9)	Can be absorbed through the skin.
-----------------------	-----------------------------------

US ACGIH Threshold Limit Values: Skin designation

Lindane (CAS 58-89-9)	Danger of cutaneous absorption
-----------------------	--------------------------------

US NIOSH Pocket Guide to Chemical Hazards: Skin designation

Lindane (CAS 58-89-9)	Can be absorbed through the skin.
-----------------------	-----------------------------------

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Lindane (CAS 58-89-9)	Can be absorbed through the skin.
-----------------------	-----------------------------------

Appropriate engineering controls	For laboratory operations, use local exhaust ventilation or a ventilated enclosure for high energy operations such as particle sizing. Control exposures to below the occupational exposure level (if available). Select and use containment devices and personal protective equipment based on a risk assessment of exposure potential. Cover all containers for solutions and slurries while being transferred.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear safety glasses with side shields, chemical splash goggles, or full face shield, if necessary. Base the choice of protection on the job activity and potential for contact with eyes or face. An emergency eye wash station should be available.
Skin protection	
Hand protection	Wear nitrile or other impervious gloves if skin contact is possible. When the material is dissolved or suspended in an organic solvent, wear gloves that provide protection against the solvent.
Other	Train employees in proper gowning and degowning practices. Wear lab coat. Base the choice of skin protection on the job activity, potential for skin contact and solvents and reagents in use. Do not wear protective garments in common areas (e.g., cafeterias) or out-of-doors.
Respiratory protection	Respirators are generally not required for laboratory operations. Use a tight-fitting full-face respirator with HEPA filters for spill cleanup. Choose respiratory protection appropriate to the task and the level of existing engineering controls.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	Handling practices in this SDS are recommendations for laboratory use of USP materials.

9. Physical and chemical properties

Appearance	Appearance descriptions are general information and not specific to any USP lot.
Physical state	Solid.
Form	Crystalline powder.
Color	White.
Odor	Odorless. Faint odor.
Odor threshold	0.33 ppm
pH	Not available.
Melting point/freezing point	233.6 - 235.4 °F (112 - 113 °C)
Initial boiling point and boiling range	614.12 °F (323.4 °C)
Flash point	150.0 °F (65.6 °C)
Evaporation rate	Not available.
Flammability (solid, gas)	Not available.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	Not available.
Flammability limit - upper (%)	Not available.
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Solubility(ies)	
Solubility (water)	Practically insoluble.
Solubility (other)	Ethylene glycol: Slightly soluble. Ether: Sparingly soluble. Chloroform: Freely soluble. Dehydrated alcohol: Soluble.
Partition coefficient (n-octanol/water)	3.72
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.

Viscosity Not available.

Other information

Chemical family Cyclohexane derivative.

Molecular formula C₆H₆Cl₆

Molecular weight 290.83 g/mol

Specific gravity 1.85

10. Stability and reactivity

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

Chemical stability Material is stable under normal conditions.

Possibility of hazardous reactions No dangerous reaction known under conditions of normal use.

Conditions to avoid Contact with incompatible materials.

Incompatible materials Strong acids. Strong bases. Oxidizing agents.

Hazardous decomposition products Cl-. Irritating and/or toxic fumes or gases. Emits toxic fumes under fire conditions.

11. Toxicological information

Information on likely routes of exposure

Inhalation Harmful if inhaled.

Skin contact Fatal in contact with skin.

Eye contact Knowledge about health hazard is incomplete.

Ingestion Toxic if swallowed.

Symptoms related to the physical, chemical and toxicological characteristics Skin rash. Headache. Dizziness. Clumsiness. Nervousness. Rapid heart rate. Cramps. Nausea. Gastrointestinal disturbances.

Information on toxicological effects

Acute toxicity Fatal in contact with skin. Toxic if swallowed. Harmful if inhaled.

Product	Species	Test Results
Lindane (CAS 58-89-9)		
Acute		
Dermal		
LD50	Rabbit	50 mg/kg
Inhalation		
LC50	Rat	1.56 mg/l
Oral		
LD50	Rat	76 mg/kg

Skin corrosion/irritation Knowledge about health hazard is incomplete.

Serious eye damage/eye irritation Knowledge about health hazard is incomplete.

Respiratory or skin sensitization

Respiratory sensitization Knowledge about health hazard is incomplete.

Skin sensitization Based on available data, the classification criteria are not met.

Guinea pig maximization test
Result: Negative.

Germ cell mutagenicity May cause genetic defects.

Mutagenicity

Chromosome aberration
Result: Positive.
Dominant lethal test
Result: Positive.
Species: Mouse

Carcinogenicity May cause cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity

Lindane (CAS 58-89-9)

1 Carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

US. National Toxicology Program (NTP) Report on Carcinogens

Lindane (CAS 58-89-9)

Reasonably Anticipated to be a Human Carcinogen.

Reproductive toxicity

May cause harm to breastfed babies.

Although pregnancy studies in animals have not shown that lindane causes adverse effects on the fetus, its therapeutic use is not recommended during pregnancy due to its potential for causing central nervous system toxicity. In studies in animals, large doses of lindane produced testicular toxicity.

Reproductivity

< 100 ppm Reproductivity

Result: No adverse effects.

Species: Rat

< 15 mg/kg Reproductivity

Result: No teratogenic effects.

Species: Rabbit

Specific target organ toxicity - single exposure

Knowledge about health hazard is incomplete.

Specific target organ toxicity - repeated exposure

May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard

Based on available data, the classification criteria are not met.

Further information

Pharmacologically active material. Occupational exposure may cause physiological effects.

12. Ecological information

Ecotoxicity

Product	Species		Test Results
Lindane (CAS 58-89-9)			
Aquatic			
Crustacea	EC50	Water flea (Daphnia pulex)	0.386 - 0.547 mg/l, 48 hours
Fish	LC50	Rainbow trout, donaldson trout (Oncorhynchus mykiss)	0.02 - 0.027 mg/l, 96 hours

Persistence and degradability

No data is available on the degradability of this substance.

Bioaccumulative potential

Mobility in soil

No data available.

Other adverse effects

No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions

Dispose in accordance with all applicable regulations. Under RCRA, it is the responsibility of the user of the product to determine, at the time of disposal, whether the product meets RCRA criteria for hazardous waste.

Local disposal regulations

Dispose in accordance with all applicable regulations.

Hazardous waste code

D013: Waste Lindane

The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

US RCRA Hazardous Waste U List: Reference

Lindane (CAS 58-89-9)

U129

Waste from residues / unused products

Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).

Contaminated packaging

Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

UN number

UN2761

UN proper shipping name

Organochlorine pesticide, solid, toxic (Lindane)

Transport hazard class(es)

Class	6.1
Subsidiary risk	-
Packing group	I
Packaging non bulk	211
Packaging bulk	242

IATA

UN number	UN2761
UN proper shipping name	Organochlorine pesticide, solid, toxic (Lindane)
Transport hazard class(es)	

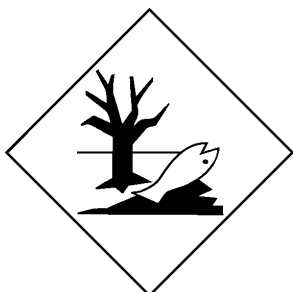
Class	6.1
Subsidiary risk	-
Packing group	I

Other information

Passenger and cargo aircraft Allowed with restrictions.

Cargo aircraft only Allowed with restrictions.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable.

DOT; IATA**Marine pollutant****General information**

It is the shipper's responsibility to determine the correct transport classification at the time of shipment.

15. Regulatory information**US federal regulations**

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Toxic Substances Control Act (TSCA)**TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)**

Not regulated.

CERCLA Hazardous Substance List (40 CFR 302.4)

Lindane (CAS 58-89-9) Listed.

SARA 304 Emergency release notification

Cyclohexane,
1,2,3,4,5,6-hexachloro-, (1.alpha.,2.alpha.,3.beta.,4.alpha.,
5.alpha.,6.beta.)- (CAS 58-89-9) 1 LBS

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1053)

Not listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)**SARA 302 Extremely hazardous substance**

Chemical name	CAS number	Reportable quantity (pounds)	Threshold planning quantity (pounds)	Threshold planning quantity, lower value (pounds)	Threshold planning quantity, upper value (pounds)
Lindane	58-89-9	1		1000	10000

SARA 311/312 Hazardous chemical

Classified hazard categories	Acute toxicity (any route of exposure) Germ cell mutagenicity Carcinogenicity Reproductive toxicity Specific target organ toxicity (single or repeated exposure)
-------------------------------------	--

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
Lindane	58-89-9	100

Other federal regulations**Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List**

Lindane (CAS 58-89-9)

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Water Act (CWA) Section 112(r) (40 CFR 68.130)	Hazardous substance Priority pollutant Bioaccumulative chemical of concern Toxic pollutant
---	---

Safe Drinking Water Act (SDWA)	Contains component(s) regulated under the Safe Drinking Water Act.
---------------------------------------	--

US state regulations**California Proposition 65**

WARNING: This product can expose you to Lindane, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

California Proposition 65 - CRT: Listed date/Carcinogenic substance

Lindane (CAS 58-89-9)

Listed: October 1, 1989

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Chemical Substance Inventory (TCSI)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 10-12-2005

Material name: Lindane

1367504 Version #: 04 Revision date: 08-20-2021 Issue date: 10-12-2005

USP SDS US

8 / 9

Revision date

08-20-2021

Version #

04

Disclaimer

USP materials are sold for analytical laboratory use only, and NOT for human consumption. The information contained herein is applicable solely to the chemical substance when used for analytical laboratory use and does not necessarily relate to any other use of the substance described, (i.e. at different concentrations, in drug dosage forms, or in bulk quantities). USP materials are intended for use by persons having technical skill and at their own discretion and risk. This information has been developed by USP staff from sources considered reliable but has not been independently verified by the USP. Therefore, the USP Convention cannot guarantee the accuracy of the information in these sources nor should the statements contained herein be considered an official expression. NO REPRESENTATION OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE is made with respect to the information contained herein.