SAFETY DATA SHEET

1. Identification

Product identifier  Heptachlor

Other means of identification

<table>
<thead>
<tr>
<th>Item</th>
<th>CAS number</th>
<th>Synonyms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>76-44-8</td>
<td>1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-Tetrahydro-4,7-methanoindene; Heptachlor</td>
</tr>
</tbody>
</table>

Recommended use  Not available.

Recommended restrictions  None known.

Manufacturer/Importer/Supplier/Distributor information

Manufacturer

<table>
<thead>
<tr>
<th>Company name</th>
<th>Address</th>
<th>Telephone</th>
<th>Website</th>
<th>E-mail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chem Service, Inc.</td>
<td>660 Tower Lane</td>
<td>Toll Free 800-452-9994</td>
<td><a href="http://www.chemservice.com">www.chemservice.com</a></td>
<td><a href="mailto:info@chemservice.com">info@chemservice.com</a></td>
</tr>
<tr>
<td></td>
<td>West Chester, PA 19380</td>
<td>Direct 610-692-3026</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Emergency phone number

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemtrec US</td>
<td>800-424-9300</td>
<td></td>
</tr>
<tr>
<td>Chemtrec outside US</td>
<td>+1 703-527-3887</td>
<td></td>
</tr>
</tbody>
</table>

2. Hazard(s) identification

Physical hazards  Not classified.

Health hazards

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Category 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acute toxicity, oral</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acute toxicity, dermal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specific target organ toxicity, repeated exposure</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Environmental hazards

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>Category 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous to the aquatic environment, acute hazard</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hazardous to the aquatic environment, long-term hazard</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

OSHA defined hazards  Not classified.

Label elements

Signal word  Danger

Hazard statement  Fatal if swallowed. Fatal in contact with skin. Suspected of causing cancer. Suspected of damaging fertility or the unborn child. May cause damage to organs through prolonged or repeated exposure. Very toxic to aquatic life. Very toxic to aquatic life with long lasting effects.

Precautionary statement

Prevention

Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Do not eat, drink or smoke when using this product. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection.
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. Collect spillage.

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
None.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>Common name and synonyms</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptachlor</td>
<td>1,4,5,6,7,8,8-Heptachloro-3a,4,7,7a-Tetrahydro-4,7-methanoindene; Heptachlor</td>
<td>76-44-8</td>
<td>100</td>
</tr>
</tbody>
</table>

4. First-aid measures

Inhalation
Move to fresh air. Call a physician if symptoms develop or persist.

Skin contact
Take off immediately all contaminated clothing. Wash off with soap and water. Call a physician or poison control center immediately. Wash contaminated clothing before reuse.

Eye contact
Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician or poison control center immediately.

Ingestion
Call a physician or poison control center immediately. Rinse mouth. Do not induce vomiting without advice from poison control center. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Do not use mouth-to-mouth method if victim ingested the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

Most important symptoms/effects, acute and delayed
Convulsions. Prolonged exposure may cause chronic effects.

Indication of immediate medical attention and special treatment needed
Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

General information
Take off immediately all contaminated clothing. IF exposed or concerned: Get medical advice/attention. If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance. Discard any shoes or clothing items that cannot be decontaminated.

5. Fire-fighting measures

Suitable extinguishing media
Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media
Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical
During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters
Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions
Use water spray to cool unopened containers.

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. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
This material is classified as a water pollutant under the Clean Water Act and should be prevented from contaminating soil or from entering sewage and drainage systems which lead to waterways.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. Put material in suitable, covered, labeled containers. For waste disposal, see section 13 of the SDS.

Avoid release to the environment. Inform appropriate managerial or supervisory personnel of all environmental releases. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

Precautions for safe handling
Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not get in eyes, on skin, or on clothing. Do not taste or swallow. Avoid prolonged exposure. When using, do not eat, drink or smoke. Pregnant or breastfeeding women must not handle this product. Should be handled in closed systems, if possible. Provide adequate ventilation. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Avoid release to the environment. Wash contaminated clothing before reuse. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Store locked up. Store in original tightly closed container. Store away from incompatible materials (see Section 10 of the SDS).

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)

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptachlor (CAS 76-44-8)</td>
<td>PEL</td>
<td>0.5 mg/m3</td>
</tr>
</tbody>
</table>

US. ACGIH Threshold Limit Values

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptachlor (CAS 76-44-8)</td>
<td>TWA</td>
<td>0.05 mg/m3</td>
</tr>
</tbody>
</table>

US. NIOSH: Pocket Guide to Chemical Hazards

<table>
<thead>
<tr>
<th>Material</th>
<th>Type</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptachlor (CAS 76-44-8)</td>
<td>TWA</td>
<td>0.5 mg/m3</td>
</tr>
</tbody>
</table>

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

Exposure guidelines

US - California OELs: Skin designation

- Heptachlor (CAS 76-44-8) Can be absorbed through the skin.

US - Minnesota Haz Subs: Skin designation applies

- Heptachlor (CAS 76-44-8) Skin designation applies.

US - Tennessee OELs: Skin designation

- Heptachlor (CAS 76-44-8) Can be absorbed through the skin.

US ACGIH Threshold Limit Values: Skin designation

- Heptachlor (CAS 76-44-8) Can be absorbed through the skin.

US NIOSH Pocket Guide to Chemical Hazards: Skin designation

- Heptachlor (CAS 76-44-8) Can be absorbed through the skin.

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

- Heptachlor (CAS 76-44-8) Can be absorbed through the skin.

Appropriate engineering controls

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

Individual protection measures, such as personal protective equipment

Eye/face protection
Wear safety glasses with side shields (or goggles).
Skin protection
  Hand protection  Wear appropriate chemical resistant gloves.
  Other  Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.
Respiratory protection  In case of insufficient ventilation, wear suitable respiratory equipment.
Thermal hazards  Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations  Observe any medical surveillance requirements. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

9. Physical and chemical properties

Appearance
  Physical state  Solid.
  Form  Solid. Crystalline Solid
  Color  Colorless
Odor  Not available.
Odor threshold  Not available.
pH  Not available.
Melting point/freezing point 203 - 204.8 °F (95 - 96 °C)
Initial boiling point and boiling range 293 °F (145 °C) 0.199984 kPa
Flash point  Not available.
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 0.00005 kPa (77 °F (25 °C))
Vapor density  Not available.
Relative density  Not available.
Solubility(ies)
  Solubility (water)  0.01 g/l
Partition coefficient (n-octanol/water)  6.1
Auto-ignition temperature  Not available.
Decomposition temperature  Not available.
Viscosity  Not available.
Other information
  Density  1.5698 g/cm³ estimated at 9 °C
  Explosive properties  Not explosive.
  Molecular formula  C₁₀-H₅-Cl₇
  Molecular weight  373.32 g/mol
  Oxidizing properties  Not oxidizing.
  Specific gravity  1.57 at 9 °C

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
Hazardous polymerization does not occur.

Conditions to avoid
Contact with incompatible materials.

Incompatible materials
Strong oxidizing agents.

Hazardous decomposition products
No hazardous decomposition products are known.

11. Toxicological information

Information on likely routes of exposure

<table>
<thead>
<tr>
<th>Route</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inhalation</td>
<td>Prolonged inhalation may be harmful.</td>
</tr>
<tr>
<td>Skin contact</td>
<td>Fatal in contact with skin.</td>
</tr>
<tr>
<td>Eye contact</td>
<td>Direct contact with eyes may cause temporary irritation.</td>
</tr>
<tr>
<td>Ingestion</td>
<td>Fatal if swallowed.</td>
</tr>
</tbody>
</table>

Symptoms related to the physical, chemical and toxicological characteristics
Convulsions.

Information on toxicological effects

Acute toxicity
Fatal in contact with skin. Fatal if swallowed.

Skin corrosion/irritation
Prolonged skin contact may cause temporary irritation.

Serious eye damage/eye irritation
Direct contact with eyes may cause temporary irritation.

Respiratory or skin sensitization
Respiratory sensitization
Not a respiratory sensitizer.

Skin sensitization
This product is not expected to cause skin sensitization.

Germ cell mutagenicity
No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity
Suspected of causing cancer.

IARC Monographs. Overall Evaluation of Carcinogenicity
Heptachlor (CAS 76-44-8) 2B Possibly carcinogenic to humans.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not regulated.

US. National Toxicology Program (NTP) Report on Carcinogens
Not listed.

Reproductive toxicity
Suspected of damaging fertility or the unborn child.

Specific target organ toxicity - single exposure
Not classified.

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard
Not an aspiration hazard.

Chronic effects
May cause damage to organs through prolonged or repeated exposure. Prolonged inhalation may be harmful. Prolonged exposure may cause chronic effects.

12. Ecological information

Ecotoxicity
Very toxic to aquatic life with long lasting effects.

<table>
<thead>
<tr>
<th>Product</th>
<th>Species</th>
<th>Test Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptachlor (CAS 76-44-8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aquatic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crustacea</td>
<td>EC50</td>
<td>Water flea (Daphnia pulex)</td>
</tr>
<tr>
<td>Fish</td>
<td>LC50</td>
<td>Pinfish (Lagodon rhomboides)</td>
</tr>
</tbody>
</table>

* Estimates for product may be based on additional component data not shown.

Persistence and degradability

Bioaccumulative potential

Partition coefficient n-octanol / water (log Kow)
6.1

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 Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations Dispose in accordance with all applicable regulations.
Hazardous waste code The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

US RCRA Hazardous Waste P List: Reference
Heptachlor (CAS 76-44-8) P059

Waste from residues / unused products Dispose of in accordance with local regulations. 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. Empty containers should be taken to an approved waste handling site for recycling or disposal.

14. Transport information
DOT
UN number UN2811
UN proper shipping name Toxic solids, organic, n.o.s., MARINE POLLUTANT
Transport hazard class(es)
  Class 6.1(PGI, II)
  Subsidiary risk -
  Label(s) 6.1
Packing group II
Environmental hazards Marine pollutant Yes
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Special provisions IB8, IP2, IP4, T3, TP33
Packaging exceptions 153
Packaging non bulk 212
Packaging bulk 242

IATA
UN number UN2811
UN proper shipping name Toxic solid, organic, n.o.s.
Transport hazard class(es)
  Class 6.1(PGI, II)
  Subsidiary risk -
Packing group II
Environmental hazards No.
ERG Code 6L
Special precautions for user Read safety instructions, SDS and emergency procedures before handling.
Other information
  Passenger and cargo aircraft Allowed with restrictions.
  Cargo aircraft only Allowed with restrictions.

IMDG
UN number UN2811
UN proper shipping name TOXIC SOLID, ORGANIC, N.O.S., MARINE POLLUTANT
Transport hazard class(es)
  Class 6.1(PGI, II)
  Subsidiary risk -
Packing group II
Yes
Marine pollutant
Yes
EmS
F-A, S-A
Special precautions for user
Read safety instructions, SDS and emergency procedures before handling.
Transport in bulk according to
Annex II of MARPOL 73/78 and
the IBC Code
DOT
IMDG Regulated Marine Pollutant. DOT Regulated Marine Pollutant.

15. Regulatory information
US federal regulations
This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.
TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)
Not regulated.
CERCLA Hazardous Substance List (40 CFR 302.4)
Heptachlor (CAS 76-44-8) Listed.
SARA 304 Emergency release notification
Not regulated.
OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)
Not regulated.

Superfund Amendments and Reauthorization Act of 1986 (SARA)
Hazard categories
Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

Material name: Heptachlor
N-12147 Version #: 03 Revision date: 04-29-2019 Issue date: 02-28-2014
SARA 302 Extremely hazardous substance  
Not listed.

SARA 311/312 Hazardous chemical  
Yes

SARA 313 (TRI reporting)  

<table>
<thead>
<tr>
<th>Chemical name</th>
<th>CAS number</th>
<th>% by wt.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heptachlor</td>
<td>76-44-8</td>
<td>100</td>
</tr>
</tbody>
</table>

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List  
Heptachlor (CAS 76-44-8)

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
Toxic pollutant

Safe Drinking Water Act (SDWA)  
0 mg/l
0.0004 mg/l

US state regulations

WARNING: This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.

US - California Proposition 65 - CRT: Listed date/Carcinogenic substance  
Heptachlor (CAS 76-44-8) Listed: July 1, 1988

US - California Proposition 65 - CRT: Listed date/Developmental toxin  
Heptachlor (CAS 76-44-8) Listed: August 20, 1999

International Inventories

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

*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  
02-28-2014

Revision date  
04-29-2019

Version #  
03

NFPA ratings  
Health: 4
Flammability: 0
Instability: 0
Chem Service, Inc. cannot anticipate all conditions under which this information and its product, or
the products of other manufacturers in combination with its product, may be used. It is the user's
responsibility to ensure safe conditions for handling, storage and disposal of the product, and to
assume liability for loss, injury, damage or expense due to improper use. The above information is
believed to be correct on the date it was last revised and must not be considered all inclusive. The
information has been obtained only by a search of available literature and is only a guide for
handling the chemicals. OSHA regulations require that if other hazards become evident, an
upgraded SDS must be made available to the employee within three months. RESPONSIBILITY
for updates lies with the employer and not with CHEM SERVICE, Inc.

Persons not specifically and properly trained should not handle this chemical or its container. This
product is furnished FOR LABORATORY USE ONLY! Our products may NOT BE USED as drugs,
cosmetics, agricultural or pesticide products, food additives or as household chemicals.

This Safety Data Sheet (SDS) is intended only for use with Chem Service, Inc. products and
should not be relied on for use with materials from any other supplier even if the chemical name(s)
on the product are identical! Whenever using an SDS for a solution or mixture the user should
refer to the SDS for every component of the solution or mixture. Chem Service warrants that this
SDS is based upon the most current information available to Chem Service at the time it was last
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WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF
MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE. This SDS is provided
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electronic or any other form.

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Revision information
This document has undergone significant changes and should be reviewed in its entirety.